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ABSTRACT

This document is intended to help education and training institutions deliver the Machine Tool Advanced Skills Technology (MAST) curriculum to a variety of individuals and organizations. MAST consists of industry-specific skill standards and model curricula for 15 occupational specialty areas within the U.S. machine tool and metals-related industries. This volume is organized in the following sections: (1) career development--information on establishing and operating career development centers that help students prepare for careers in the machining and machine tool industries; (2) career action plans--the methods and procedures for developing a career path in the industries for high school students, displaced workers, and employees who want to upgrade their skills; (3) career orientation modules--a 6-week or 180-hour self-paced introduction to the basic hand tools, practices, and equipment used in the machine tool and metal-working occupations; (4) sample internship agreement; (5) outlines of eight remediation courses (three reading, two English, and three mathematics) developed to raise students' skills and knowledge to the level necessary to succeed in college; (6) 11 general education courses (four English, three mathematics, one physics, and three psychology) to be offered in conjunction with the technical courses; and (7) MAST Remote Site and Industrial Model--guidelines for using the MAST technical curricula as a base in preparing customized training for industry customers to update the skills of current employees. Appendixes containing forms necessary to market, plan and implement, the MAST training model and sample training modules are included. (KC)

ED 401 432

Machine Tool
Advanced
Skills
Technology

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COMMON GROUND: TOWARD A STANDARDS-BASED TRAINING SYSTEM FOR THE U.S. MACHINE TOOL AND METAL RELATED INDUSTRIES

VOLUME 2

CAREER DEVELOPMENT

of
a 15 volume set of Skills Standards
and
Curriculum Training Materials for the
PRECISION MANUFACTURING INDUSTRY

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MAST

VOLUME 2

CAREER DEVELOPMENT, GENERAL EDUCATION AND REMEDIATION

Supported by
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- U.S. Department of Education, Office of Vocational & Adult Education
- MAST Consortia of Employers and Educators

MAST DEVELOPMENT CENTERS

Augusta Technical Institute - Itawamba Community College - Moraine Valley Community College - San Diego City College (CACT) - Springfield Technical Community College - Texas State Technical College

INDUSTRIES

AB Lasers - AIRCAP/MTD - ALCOA - American Saw - AMOCO Performance Products - Automatic Switch Company - Bell Helicopter - Bowen Tool - Brunner - Chrysler Corp. - Chrysler Technologies - Conveyor Plus - Darr Caterpillar - Davis Technologies - Delta International - Devon - D. J. Plastics - Eaton Leonard - EBTEC - Electro-Motive - Emergency One - Eureka - Foster Mold - GeoDiamond/Smith International - Greenfield Industries - Hunter Douglas - Industrial Laser - ITT Engineered Valve - Kaiser Aluminum - Krueger International. - Laser Fare - Laser Services - Lockheed Martin - McDonnell Douglas - Mercury Tool - NASSCO - NutraSweet - Rapistan DEMAG - Reed Tool - ROHR, International - Searle - Solar Turbine - Southwest Fabricators - Smith & Wesson - Standard Refrigeration - Super Sagless - Taylor Guitars - Tecumseh - Teledyne Ryan - Thermal Ceramics - Thomas Lighting - FMC, United Defense - United Technologies Hamilton Standard

COLLEGE AFFILIATES

Aiken Technical College - Bevil Center for Advanced Manufacturing Technology - Central Florida Community College - Chicago Manufacturing Technology Extension Center - Great Lakes Manufacturing Technology Center - Indiana Vocational Technical College - Milwaukee Area Technical College - Okaloosa-Walton Community College - Piedmont Technical College - Pueblo Community College - Salt Lake Community College - Spokane Community College - Texas State Technical Colleges at Harlington, Marshall, Sweetwater

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Aiken Career Center - Chicopee Comprehensive High School - Community High School (Moraine, IL) - Connally ISD - Consolidated High School - Evans High - Greenwood Vocational School - Hoover Sr. High - Killeen ISD - LaVega ISD - Lincoln Sr. High - Marlin ISD - Midway ISD - Moraine Area Career Center - Morse Sr. High - Point Lamar Sr. High - Pontotoc Ridge Area Vocational Center - Putnam Vocational High School - San Diego Sr. High - Tupelo-Lee Vocational Center - Waco ISD - Westfield Vocational High School

ASSOCIATIONS

American Vocational Association (AVA) - Center for Occupational Research and Development (CORD) - CIM in Higher Education (CIMHE) - Heart of Texas Tech-Prep - Midwest (Michigan) Manufacturing Technology Center (MMTC) - National Coalition For Advanced Manufacturing (NACFAM) - National Coalition of Advanced Technology Centers (NCATC) - National Skills Standards Pilot Programs - National Tooling and Machining Association (NTMA) - New York Manufacturing Extension Partnership (NYMEP) - Precision Metalforming Association (PMA) - Society of Manufacturing Engineers (SME) - Southeast Manufacturing Technology Center (SMTC)

MAST PROJECT EVALUATORS

Dr. James Hales, East Tennessee State University and William Ruxton, National Tooling and Machine Association (NTMA)

SPECIAL RECOGNITION

Dr. Hugh Rogers recognized the need for this project, developed the baseline concepts and methodology, and pulled together industrial and academic partners from across the nation into a solid consortium. Special thanks and singular congratulations go to Dr. Rogers for his extraordinary efforts in this endeavor.

This report is primarily based upon information provided by the above companies, schools and labs. We sincerely thank key personnel within these organizations for their commitment and dedication to this project. Including the national survey, more than 3,000 other companies and organizations participated in this project. We commend their efforts in our combined attempt to reach some common ground in precision manufacturing skills standards and curriculum development.

This material may be found on the Internet at **http://machinetool.tstc.edu**

CATALOG OF 15 VOLUMES

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VOLUME 3	MACHINING - CORE COURSES (MAC)
VOLUME 4	MANUFACTURING ENGINEERING TECHNOLOGY (MET)
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VOLUME 7	INDUSTRIAL MAINTENANCE (IMM)
VOLUME 8	SHEET METAL (SML) AND COMPOSITES (COM)
VOLUME 9	TOOL AND DIE (TLD)
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VOLUME 2

CAREER DEVELOPMENT, GENERAL EDUCATION AND REMEDIATION

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Foreword

Providing education and training in machine tool and metals-related occupations requires more than just high-quality technical courses. Community colleges and other education and training providers must be able to attract people to their programs, help them plan their career paths, and provide them with remedial training (if necessary) and general education training. They also need to be able to work with industry, both to build a path for their students to find jobs, and to meet the training needs of the companies' existing workers.

Volume 2 is intended to help education and training institutions deliver the MAST curriculum to a variety of individuals and organizations. It contains information and materials these institutions can use to promote machine tool and metals-related occupations, help individuals select and succeed in training for these occupations, and upgrade the skills of individuals currently working in these occupations.

The section on ***Career Development*** provides information on establishing and operating career development centers that help students plan and prepare for careers in the machining and machine tool industries.

The ***Career Action Plans*** section contains a series of career action plans outlining the methods and procedures for developing a career path in the machine tool and metals-related industries for three types of individuals: high school students, displaced workers, and employed individuals who want to prepare themselves for better career opportunities in the future.

The ***Career Orientation Modules*** are a six-week or 180-hour self-paced introduction to the basic hand tools, practices and equipment used in the machine tool and metal-working occupations. The modules are best used with the guidance of an instructor and should be accompanied by the MAST video. A sample ***Internship Agreement*** is provided as well to be used by schools and companies to establish mutually productive industry internships for students.

The ***Remediation Courses*** section includes eight course syllabi (three reading, two English, and three math), researched, validated, and documented by the MAST project, to raise students' skills and knowledge to the level necessary to start and succeed in college.

The eleven ***General Education Courses*** (four English, three math, one physics, and three psychology) that were researched, validated, and documented by MAST Development Centers as well, should be offered in conjunction with the technical courses in the machine tool and metals-related occupations.

Finally, the ***MAST Remote Site/Industrial Training Model*** provides guidelines for using the MAST technical curricula as a base in preparing customized training for industry customers to update the skills of current employees.

CAREER DEVELOPMENT

Today, individuals are limited only by their imagination. Everyone wants to succeed, but most still hold to the traditional view that the only path to success is through a 4 year degree. Parents, in particular, believe that this is the best option available for their children. The facts, however, show that skilled technicians actually enter the workforce at a higher rate of pay than the average 4 year college graduate.

Times have changed. The American dream has not changed, but the way to achieve it has. The ladder to success has turned into a speedway for technology. Like a high-powered machine, technology is accelerating at such a fast pace many are left behind. In a world full of ex-bankers, brokers and business majors; skilled educated technicians are competing very well indeed.

Career Development for this new world includes preparation for employment and industrial contact. Outside the formal structure of educational institutions, students need the ability to connect with the real world when addressing the issues of career development. Today's job seeker must not only be well trained in a particular career field, he/she must also be well equipped with the polished techniques of knowing how to land the ultimate job.

As the nation recognizes and responds to the need for newer and more effective methods of training and upgrading skills, individuals who acquire those skills will also require assistance in securing employment. A Career Development Center should address job placement services to help reduce the time frame of unemployment or underemployment. While employers are expecting skills, in addition to formal degrees, colleges must expand their services to meet the demands of the work place through continuing education, training centers and contract education with industry. Targeted groups include not only the traditional student; placement services will also need to include those who are returning to be retrained. Moreover, placement centers must offer targeted assistance for a growing group of special populations, such as the disabled, single parents, dislocated workers, whose needs offer new challenges for placement departments. Ideally, Career Development Centers should serve as a one-stop shop for those needing and seeking comprehensive career educational and job training information.

CAREER DEVELOPMENT CENTER

Success in a global economy must start in the schools. Students must be prepared to tackle the challenges that technology brings to them. But educators must be willing to keep up with modern technological advances. Staying up-to-date with industry, however, is not the school's only challenge. In today's environment, a technical or community college must go beyond the normal placement business. Job placement is but one aspect of what a college's Career Development Center must accomplish for it's students. The student's file should be managed from the point of his initial inquiry to well after his employment for follow on assessment to monitor and adjust curriculum to fit not only current industry requirements, but future trends as well. A Career Development Center really needs to take a "Life Cycle" approach.

Career development is an infinite process. It encompasses life's experiences to include influences that serve as a guide in directing one to a particular career field. One's personality, skills, talents, interests, environment and social life all play a part in career development. It focuses on the culmination of life's experiences when addressing career choices. It is also a fluid process; as society changes, so does an individual's interests, as technology continues to shape the current and future job market.

A Career Development Center serves as a facilitation organization to help students reach their career goals by offering career advisement, support activities and employment assistance and employment follow-up and assessment. The center should basically assist students in planning, preparation and placement (Figure D-1).

CAREER DEVELOPMENT CENTER

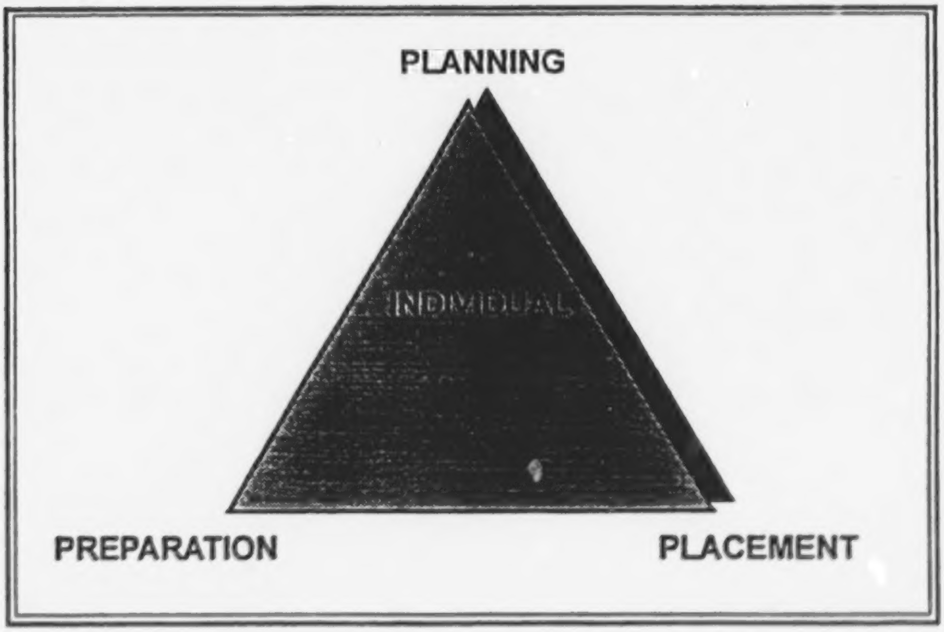

Figure D-1

PLANNING

Planning involves a process whereby, based upon one's unique personal inventory (skills, interest and aptitude), individuals can make intelligent educational and career choices. Career development planning should encompass personal, social, educational and career goals.

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The planning process is infinite in structure and must undergo periodic review. Career Development Centers should aid students in identifying personal capabilities, values, needs, and the impact they have on career choices. Centers assist in paralleling an individual's makeup with a specific occupational field. It also helps students fine-tune career and lifelong goals based upon an understanding of oneself and the real world, resulting in individualized career plans. Moreover, these influential processes should be a joint effort between counselors, faculty, family, friends, industry representatives and alumni, expanding upon experiences such as formal/informal education, career exploration, job shadowing, and internships or apprenticeships.

PREPARATION

To effectively prepare clients in meeting their needs, the center should address several basic goals:

- Provide a library of up-to-date career information;
- Aid clients in researching career fields which match their individual interest, aptitude, etc.;
- Provide services such as achievement testing, aptitude testing, career interest inventories, computerized career exploration, etc. to better determine career possibilities;
- Support career-related educational instruction in coordination with faculty; and
- Establish the framework for parents and industry representatives to share in career goals.

Information provided by centers should include:

- Occupational data for civilian and military careers that address training requirements, job duties, placement statistics, job outlook, advancement and labor market information;
- Training data related to universities, community colleges, vocational-technical institutions, apprenticeships and on-the-job training;
- Information to assist in making career choices, such as survey evaluations and tests of individual's interests and aptitudes;
- Local/state/federal test preparation material concerning educational and career choices;
- Career exploration and job seeking information relative to employment applications, resumes, cover letters, interviewing techniques, etc.; and
- Information related to scholarships, financial assistance, admissions assistance.

PLACEMENT

One of the primary purposes of a Job Development Center is to focus on employment opportunities for students and graduates. The mission includes not only career assistance while one is attaining his/her educational goals, but also career placement once the individual has completed his/her education.

Job placement services should (1) provide resources and job search strategies that enable students to achieve their goals, (2) serve as a communication channel between instructors, counselors and placement staff, (3) establish and market relationships between industry/business to secure co-op, internship and employment opportunities, (4) coordinate employment prospects for graduates and (5) organize career information and opportunities.

The ability to secure employment is of paramount importance to society. Trends indicate that post secondary institutions are being challenged reference placement accountability. With recruitment and retention becoming major issues concerning institutions, a student's college choice is determined not only by career interest, but also by placement statistics and salary analysis, which are valuable services provided by career centers. Data concerning the types of jobs graduates are securing, numbers of students being placed, whether individuals are employed in related fields of study and average starting salaries all contribute to educational and career decisions. Overall, the functions of job placement services should address pre-employment preparation, job development, career placement and follow-up/follow-through.

PRE-EMPLOYMENT PREPARATION

Pre-Employment preparation is the process by which one obtains the necessary skills to secure and keep employment in their chosen field. Preparation includes techniques involved in the job search, accurately completing employment applications, customized resumes and polished interviewing tactics. When mastered, these techniques should remain with the individual for a lifetime, as job turnover and competition for specific jobs continue to increase.

The job placement center is in the unique position to offer the skills that are necessary for the transition from school or unemployment to work. The center may offer workshops, seminars and individual sessions for students. Also, integration of resume writing/interviewing techniques may be incorporated within classes, with the cooperation of faculty and placement center staff. Ideally, a credit or non-credit career course may be added to an institution's curriculum.

Pre-employment preparation should address:

- Pre-Employment instruction and counseling:
  - Plan of action for job hunting
  - Obtaining employment information
- Career objectives:
  - Targeting type of job desired, advancement, employment outlook
- Job search process:
  - Sources and location of employment
  - Placement assistance within the college, other organizations and identification of key individuals
  - Employer preference concerning skills, attitudes, etc.
  - Job referrals
- Resume preparation
- Completion of job applications
- Interviewing skills and techniques:

  - Proper dress/grooming
  - Questions asked by the employer
  - Questions asked by the interviewee
- Employability skills:
  - Teamwork orientation
  - Computer literacy
  - Proper workplace readiness skills
  - Good work ethic
  - Positive attitude
  - Punctuality
  - Desire to do the right job
  - Common courtesy
  - Social skills
- Data concerning employment trends and job specifics:
  - Marketing one's credentials with employer needs
  - Listing of employers who have hired prior graduates
  - Institution placement reports concerning employment, entry-level salaries, etc.
- Correspondence to employers:
  - Cover letters
  - Follow-up letters, thank you's after the interview
  - Letters of acceptance/rejection concerning job offers
- Federal/state/local legislation concerning employment

JOB DEVELOPMENT

Job development is the process of locating and/or creating potential employment prospects for individuals. This includes identifying qualified candidates and matching their skills to business/industry, tapping into new and emerging opportunities within career fields and being on the cutting edge of developing new occupations that were previously non-existent. Although graduate employment cannot be guaranteed by institutions, sufficient potential employers should be developed in each career field. As verification of educational effectiveness remains a primary issue, a joint effort between business/industry and placement centers must exist, as verification of educational effectiveness remains a primary issue. Since college customers include not only the student, but also the hiring entity, job development functions must address the need to locate potential employers for students and to locate qualified persons for the business sector. Job development is a two-way street; job centers must establish an on-going, mutually beneficial relationship with the business sector in order for students to have ample employment options. Community networking and an active advisory council that includes representatives from education, business, industry, trade associations, community leaders and technical instructors contribute to effective job development.

Job development includes determining students' employment needs and building correlated employer files. The types of educational courses offered at the institution serves as the basis of job development, and student employment needs will determine the types of employment opportunities available. An employer list should identify organizations that are possible employers for qualified students. The result would be a potential match of individual skills/needs of students to that of skills/needs of employers. Job analysis involves the assessment of an employer's needs in determining the proper placement of graduates. Both job analysis and job development go hand-in-hand. Effective job analysis results in the creation of jobs that previously did not exist and successfully identifying sources of employers.

Sources of potential employers include:

- Personal referrals/networking
- Former students
- Current students who are working
- Instructors/staff
- Advisory councils
- Chambers of Commerce
- Employment commissions
- Rehabilitation commissions
- Civil services agencies
- Newspaper advertisements
- Telephone directories
- Employer directories
- Community service organizations
- Public libraries

Placement centers usually contact employers by mail/survey, telephone or personal visitation in order to secure various employment opportunities. Serving as the campus liaison between students and employers, the methods used in advertising the college and candidates to potential employers could include:

- Association newsletter articles
- Radio and television advertising
- Newspaper and magazine advertising
- Professional association coverage
- Business staff meeting presentations
- Resume books
- Resume briefs
- Trade show booths
- Student reunions
- Business/industrial on-site visits
- Business career days/targeted job fairs
- In-house campus interviews

JOB PLACEMENT

Job placement is not a one-person task. The art of preparing an individual for placement requires the services and commitment of instructors, counselors, administrators and support staff to ensure students are properly trained and placed. Traditionally, most institutions rely on one central office to bear the responsibility for finding employment for graduates. However, the nature of the college and the fields of study or technologies offered may allow deviance from the traditional central placement office concept. For example, due to the diversity and intensity of technical curricula, a technical/vocational college may offer placement assistance within each individual technology. As programs require constant revision, due to the nature of technology, a department chair or instructor may be charged with the responsibility of placement. In terms of streamlining, this method may be more effective and specific; industry can negotiate directly with each department, and the end result would be more one-on-one, specialized attention to the needs of both the student and employer. In essence, departments that are responsible for the recruitment, education and placement of students remain more in touch when referencing accountability and effectiveness.

Nevertheless, a coordinated effort between a placement center and a program must exist in order for students to be prepared to enter the job market. The placement service is a support system of pre-employment information, resume preparation, job search and interviewing skills that are necessary for one to find employment with the least amount of expended time and effort.

To assist personnel in job placement, a center should address:

- Supporting and placing individuals in internships, cooperative education programs, community contact programs (community clubs/organizations willing to offer career planning assistance) and part-time, on/off-campus employment programs;
- Maintaining a student placement file referencing his/her skills, goals, personality, salary requirements, geographic preference and work history;
- Administering student pre-employment interviews to review the student's qualifications, occupational objective, type of job desired, resume and interview preparation;
- Maintaining a record-keeping system to effectively match position requirements to student's qualifications;
- Developing a system of job information distribution, unique to the needs of each institution (on-line campus data systems, bulletin boards, job binders, etc.);
- Directing individuals to various job openings (mail outs to graduates, resume/candidate screening, etc.); and
- Administering follow-up activities to students and employers after job referrals.

FOLLOW-UP

Institutional effectiveness and accountability are of paramount importance to any organization. A properly orchestrated follow-up system provides information that can be used in the evaluation of departments and in the documentation of data for future planning. Analysis of survey data can pinpoint individuals who are employed/unemployed and those who may need additional training. Follow-up information can also serve as a baseline in the evaluation of support services, educational departments, existing curricula and the development of new training programs.

Methods of capturing effective follow-up information include:

- Graduate surveys (Figure E-1)

- Non-completer surveys (Figure F-1)
- Employer surveys (Figure G-1)

GRADUATE SURVEYS

A graduate survey, either by mail or phone, is an excellent method of obtaining feedback from alumni concerning how effectively an institution prepared them to enter the workforce. Data captured would incorporate employment status, employing company, educational and support service effectiveness and recommendations for improvements. Moreover, placement statistics concerning each department can be compiled to document program performance, in addition to being a useful tool in marketing/recruitment and in meeting local/state/federal governmental standards. Factors such as those employed in a related/non-related field, those who entered the military or continued their education, those who are seeking employment or are unavailable for employment can be documented in a summary report that is unique to the institution and elaborated upon when referencing corresponding detail reports. Moreover, as institutions strive for a higher degree of accountability and improved methods of student tracking, several states have experimented with pilot projects such as aggregate data sharing between state employment commissions and state educational entities in an effort to further document educational/employment outcomes of students.

Nevertheless, frequency and intensity of follow-up surveys will depend upon an institution's own needs, personnel and resources. Initial, 180-day, one-year and long-term follow-ups should yield information such as:

- Former student's correct address and phone number
- Employer's name, address and job title
- Employment in a related/non-related field
- Entry-level salary, promotions, benefits
- How the student found a job
- Mobility patterns
- Opinions concerning the total educational experience
- Opinions on career readiness
- Additional education received
- Identification of possible new openings within an organization

NON-COMPLETER SURVEYS

Many institutions conduct surveys of all students who do not officially complete a program. With retention being a major concern, these non-completer surveys help document reasons for one's departure from college and aid in identifying problem areas within the campus.

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EMPLOYER SURVEYS

The employer survey is an effective instrument to use when organizations wish to document an employer's satisfaction with an individual and the degree of training he/she received while enrolled in college. As a public relations tool, it may also reinforce channels of communication when targeting new employment opportunities within the company. This survey should highlight:

- Quality of work
- Quantity of work
- Educational/technical training
- Personal skills
- Work preparation in relation to those who did not receive formal training
- Hiring source
- Suggestions for improvement in college curricula
- Future job openings, dates for hiring, etc.

As a whole, follow-up information addresses former students' needs and skills, in addition to capturing employer's and ex-student's evaluation of curricula and the institution. The end result is a higher number of better-prepared individuals entering the workforce.

FOLLOW-THROUGH

Follow-through defines a process of effectively utilizing the follow-up survey data in attaining the institution's placement and training missions. It involves thorough review and reporting of survey information to the appropriate departments in order for change to be successfully implemented. Moreover, data shared with administration, faculty, staff and advisory committees assist in the efficient documentation and facilitation for continued improvement.

As institutional effectiveness and accountability become primary issues, the Job Development Center is in the unique position of providing services in support of the total educational experience when focusing on issues such as recruitment, retention, placement, and follow-up.

GRADUATION FOLLOW-UP

Phone Number: (____)____________________

Can you be reached through the above address and phone number in 6 months?

☐ Yes ☐ No

If no, please complete below so that we may contact you:
Address:____________________
City, State & Zip:____________________
Phone Number: (____)____________________

What was your PRIMARY objective in attending our college?

- ☐ Improvement of existing job skills
- ☐ Preparation for job to be obtained
- ☐ University transfer credit
- ☐ Personal interest
- ☐ Other (describe)____________________

Please check all of the following that apply:

- ☐ Continuing education
    - ☐
    - ☐
- ☐ Unemployed
    - ☐ Actively seeking employment
    - ☐ Physically unable to accept employment
    - ☐ Personal reasons not to accept employment
    - ☐ Foreign student returning home
    - ☐ Other (please explain)____________________
- ☐ Employed
    - ☐ Employment related to major
    - ☐ Employment unrelated to major
    - ☐ Military
    - ☐ Foreign student returning home

If employed, please complete the following:

Company name____________________
Company address____________________
Company city, state, & zip:____________________
Company Phone Number:(____)____________________
Salary: $____ hourly/ hours worked per week
or $____ monthly or $____ yearly
Job Title:____________________
Date Began Employment:____________________
Job Duties:____________________

We periodically conduct surveys of employers to help us evaluate the courses we offer and to advise us on other courses and programs which are needed. If we may contact your immediate supervisor so he or she can have the opportunity to participate in such a survey, please supply the information below.

Supervisor's Name:____________________
Supervisor's Job Title:____________________

If you have completed courses in your MAJOR FIELD OF STUDY, please rate them according to how well they fulfilled your educational needs. Students with undecided/undeclared majors should skip to next question.

	Very Good	Good	Average	Poor	Very Poor
a. Quality of instruction	☐	☐	☐	☐	☐
b. Grading/Testing	☐	☐	☐	☐	☐
c. Instructor interest	☐	☐	☐	☐	☐
d. Content of course(s)	☐	☐	☐	☐	☐
e. Instructional media	☐	☐	☐	☐	☐
f. Class size	☐	☐	☐	☐	☐

If you have used any of the college services below, please rate them according to how well they fulfilled your individual needs.

	Very Good	Good	Average	Poor	Very Poor
a. Financial aids	☐	☐	☐	☐	☐
b. Counseling	☐	☐	☐	☐	☐
c. Job placement services	☐	☐	☐	☐	☐
d. Course advisement	☐	☐	☐	☐	☐
e. Tutoring services	☐	☐	☐	☐	☐
f. Veterans services	☐	☐	☐	☐	☐
g. Learning lab/packages	☐	☐	☐	☐	☐
h. Student activities	☐	☐	☐	☐	☐
i. Library services	☐	☐	☐	☐	☐

If you have enrolled in another college since your enrollment at our college, please answer the following:

On your current (or most recently attended) college:
Name of College:____________________
City and State:____________________
Your Current Major Field of Study____________________

Did you have problems transferring to the college indicated above

☐ No ☐ Yes;

What?
- ☐ Transferring credit hours
- ☐ Transcript problems
- ☐ Admissions problems
- ☐ Other (describe)____________________

How many credit hours earned at our college were not accepted at the college indicated above?

- ☐ All credit hours accepted
- ☐ Lost 1 - 3 credit hours
- ☐ Lost 4 - 6 credit hours
- ☐ Lost 7 - 12 credit hours
- ☐ Lost 13 - 21 credit hours
- ☐ Lost more than 21 credit hours

PLEASE COMPLETE OTHER SIDE OF FORM

Figure E-1

If you are currently enrolled in college, please indicate your current status and classification at the college:

STATUS	CLASSIFICATION
☐ Part-time student (less than 12 hours)	☐ Junior ☐ Senior
☐ Full-time student (12 or more hours)	☐ Graduate student ☐ Other ____________

How well did the courses you completed at our college prepare you for continuing your education?

☐ My preparation was excellent
☐ My preparation was satisfactory
☐ Good in some areas only
☐ Fair, but all areas could have been better
☐ My preparation was inadequate

How would you rate the training you received at our college in relation to its usefulness to you in performing your job?

☐ Very good
☐ Good
☐ Average
☐ Poor
☐ Very poor

Please check below if the course(s) you took at our college helped you in your occupational area in any of the following ways:

☐ Helped to obtain job
☐ Helped performance on present job
☐ Helped advance on present job
☐ None of the above
☐ Other (describe)____________

Were you employed in your occupational area PRIOR to enrolling in the course(s) completed at our college?

☐ Yes ☐ No

How would you rate the availability of jobs in your occupational area?

☐ Very good
☐ Good
☐ Average
☐ Poor
☐ Very poor

If your occupational area is NOT related to the courses you have completed at our college, please check each reason which applies. If occupational area is related to courses completed, skip to the next question.

☐ Transferred to a four-year college
☐ Not sufficiently qualified for a job in my field of college preparation
☐ Preferred to work in another field
☐ Found better paying job in another field
☐ Could not find a job in field of preparation
☐ Worked previously in field of preparation, but changed
☐ Other (describe)____________

How do you see the course(s) completed at our college in terms of your career plans?

☐ Of immediate, direct benefit
☐ Of long term, direct benefit
☐ Of indirect benefit
☐ Of no benefit

Are you interested in taking other courses at our college? You may include courses not presently offered by our college.

☐ No
☐ Yes; what course(s)? ____________

We would appreciate any comments regarding how we could improve the course(s) you have completed and/or services we have provided. Please use the space below for your comments. If you need additional space, please attach another sheet.

Signature ____________

Date ____________

BELOW SPACE RESERVED FOR COMMENTS

PLEASE COMPLETE OTHER SIDE OF FORM

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PROJECT FOLLOW-UP

What was your PRIMARY objective in attending our two-year college?
- ☐ Improvement of existing job skills
- ☐ Preparation for job to be obtained
- ☐ University transfer credit
- ☐ Personal interest
- ☐ Other (describe)________________________

To what extent has this objective been completed?
- ☐ Fully completed
- ☐ Partially completed
- ☐ Not completed

Do you plan to pursue this objective further?
- ☐ No
- ☐ Yes; where?
  - ☐ At our college
  - ☐ At another college
  - ☐ Other (describe)____________________

How much education is (or was) required to accomplish your educational objective at our college?
- ☐ Selected courses(s)
- ☐ Certificate program
- ☐ Two-year associate degree program
- ☐ Other (describe)________________________

What was your principal reason for NOT re-enrolling at our college this term?
- ☐ Completed needed courses
- ☐ Transportation problems
- ☐ Transferred to another college
- ☐ Found job in occupation related to course(s) completed at this college
- ☐ Conflicting job hours
- ☐ Financial reasons
- ☐ Change of residence
- ☐ Grade problems
- ☐ Dissatisfied with instruction
- ☐ Dissatisfied with content of courses
- ☐ Personal/family illness or injury
- ☐ Other personal/family reasons
- ☐ Other (describe)________________________

Do you currently have a college degree or certificate?
- ☐ No
- ☐ Yes; where?
  - ☐ Certificate
  - ☐ Associate Degree
  - ☐ Bachelor's
  - ☐ Master's
  - ☐ Doctorate
  - ☐ Other

    Degree or Certificate Field of Study

    ____

Are you interested in taking other courses at our college? You may include courses not presently offered by our college.
- ☐ No
- ☐ Yes; what course(s) ____________________

What is your current educational status? (check one)
- ☐ Currently attending school
- ☐ Not currently attending school

Please check all of the following that apply:
- ☐ Continuing education
  - ☐
  - ☐
- ☐ Unemployed
  - ☐ Actively seeking employment
  - ☐ Physically unable to accept employment
  - ☐ Personal reasons not to accept employment
  - ☐ Foreign student returning home
  - ☐ Other (please explain)________________
- ☐ Employed
  - ☐ Employment related to major
  - ☐ Employment unrelated to major
  - ☐ Military
  - ☐ Foreign student returning home

If employed, please complete the following:

Company name________________________

____

Company address________________________

____

Company city, state, & zip________________________

Company Phone Number:(____)________________

Salary: $____ hourly/ hours worked per week

or $____ monthly or $____ yearly

Job Title:________________________

Date Began Employment:________________________

Job Duties:________________________

We periodically conduct surveys of employers to help us evaluate the courses we offer and to advise us on other courses and programs which are needed. If we may contact your immediate supervisor so he or she can have the opportunity to participate in such a survey, please supply the information below.

Supervisor's Name:________________________

Supervisor's Job Title:________________________

PLEASE COMPLETE OTHER SIDE OF FORM

Figure F-1

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Please check below if the course(s) you took at our college helped you in your occupational area in any of the following ways.
☐ Helped to obtain job
☐ Helped performance on present job
☐ Helped advance on present job
☐ None of the above
☐ Other (describe)________________________

How would you rate the training you received at our college in relation to its usefulness to you in performing your job?
☐ Very good
☐ Good
☐ Average
☐ Poor
☐ Very poor

Would you recommend the course(s) taken at our college to others employed in positions similar to yours?
☐ No
☐ Undecided
☐ Yes

Were you employed in your occupational area PRIOR to enrolling in the courses(s) completed at our college?
☐ No
☐ Yes

We would appreciate any comments regarding how we could improve the course(s) you have completed and/or services we have provided.

Please use the space below for your comments.
Thank you.

PLEASE COMPLETE OTHER SIDE OF FORM

BELOW SPACE RESERVED FOR COMMENTS

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EMPLOYER FOLLOW-UP

IDENTIFICATION: ____________________
JOB TITLE: ____________________
PROGRAM MAJOR: ____________________

Is the job title and status of this individual accurate?
☐ Yes ☐ No, If NO, please describe change(s) below.

____
____

What is your relationship with this individual?
- ☐ Employer
- ☐ Supervisor
- ☐ Personnel Staff
- ☐ Co-worker
- ☐ Other (describe) ____________________

Please rate the training received by this individual in the following personal skill areas. Please respond only to those areas you feel are appropriate.

	Very Good	Good	Average	Poor	Very Poor
a. Accepting responsibility	☐	☐	☐	☐	☐
b. Punctuality	☐	☐	☐	☐	☐
c. Personal initiative	☐	☐	☐	☐	☐
d. Willingness to learn	☐	☐	☐	☐	☐
e. Co-worker cooperation	☐	☐	☐	☐	☐
f. Management cooperation	☐	☐	☐	☐	☐
g. Work attendance	☐	☐	☐	☐	☐
h. Work Attitude	☐	☐	☐	☐	☐
i. Personal appearance	☐	☐	☐	☐	☐
j. Compliance with policies	☐	☐	☐	☐	☐

Please rate the training received by this individual in the following technical skill areas. Please respond only to those areas you feel are applicable to the occupational area.

	Very Good	Good	Average	Poor	Very Poor
a. Mathematical Skills	☐	☐	☐	☐	☐
b. Technical knowledge	☐	☐	☐	☐	☐
c. Organizational ability	☐	☐	☐	☐	☐
d. Communication skills	☐	☐	☐	☐	☐
e. Problem solving skills	☐	☐	☐	☐	☐
f. Work quality	☐	☐	☐	☐	☐
g. Work quantity	☐	☐	☐	☐	☐
h. Manual dexterity	☐	☐	☐	☐	☐
i. Meeting the public	☐	☐	☐	☐	☐
j. Following instructions	☐	☐	☐	☐	☐
k. Operation of equipment	☐	☐	☐	☐	☐

What is your overall rating of the training received by this individual as it relates to the requirements of his or her job?
- ☐ Very good
- ☐ Good
- ☐ Average
- ☐ Poor
- ☐ Very poor

What, in your opinion, is the job outlook for program employees of this particular occupational field?

Present		Future
☐	Very good	☐
☐	Good	☐
☐	Average	☐
☐	Poor	☐
☐	Very Poor	☐

As a result of this person's training, how would you rate his or her preparation in relation to other employees in his or her working group who did not receive such training?
- ☐ No basis for comparison
- ☐ Individual is better prepared
- ☐ Both are about the same
- ☐ Individual is less prepared

To what extent, if any, has this individual's training added to his or her ability for job placement and advancement?
- ☐ Very much
- ☐ Much
- ☐ Average
- ☐ Very little
- ☐ None

What was the primary source(s) for the initial hiring of this individual?
- ☐ Employment agency
- ☐ College faculty member
- ☐ College job placement office
- ☐ Mutual acquaintance
- ☐ Applicant applied on own initiative
- ☐ Other (describe) ____________________

____
____

PLEASE COMPLETE OTHER SIDE OF FORM

Figure G-1

What suggestions do you have for improving the technical and or personal skills of future employees?

What, in your opinion, are additional areas of training (jobs titles, skills, etc.) in which our school should become involved?

PLEASE COMPLETE OTHER SIDE OF FORM

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4. Guthrie, Barbara, et al., Developing a Career Center. A Career Center Handbook for New Mexico's High School Counselors. Alamogordo: New Mexico State University, 1990. ERIC ED 341 776.

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CAREER ACTION PLANS

OVERVIEW

A career action plan serves as a road map that outlines the methods and procedures one might follow in developing a career path in a particular area. It incorporates one's total personal interest and aptitude, and includes external factors which influence decisions in a specific career field. It acts as a program guide to connect the world of work and life after high school. It serves as a checkpoint of one's progress in determining the requirements needed for entry into a chosen field. The MAST model serves as a personal plan of action for securing a job in the machine tool and metals-related trades.

Recruitment of qualified workers and the preparation of these workers are of paramount importance within the precision manufacturing industry.

The narratives and charts in this section provide "concept documentation" to colleges as they seek to provide guidance to persons who are attempting to identify and to prepare for career opportunities. Career Action Plans specifically addresses three groups of individuals.

- high school students seeking career guidance and training;
- displaced workers needing to be re-trained for future employment; and
- individuals who are employed but see a need to prepare themselves for better career opportunities in the future.

HIGH SCHOOL STUDENTS

A career action plan for high school students is at Figure A-1. The following discussion concerning the preparation of an individual career action plan at the high school level is outlined in that chart.

Traditionally, a student's formal career objective begins to materialize during high school. His/her career decision can be influenced by:

- Student's personal master file/profile
- Aptitude
- Interest
- Achievement tests
- Career information provided by high school counselor
- Parental involvement and support
- Design of educational program
- Master schedule maintained by high school counselor

Student's goals are further solidified by a career opportunities center (or whatever the local forum may be called) offered at high school. Various informational sources also include:

- Career information from industries
- Job demand from Job Services Information Network
- Internet career opportunities

HIGH SCHOOL STUDENTS

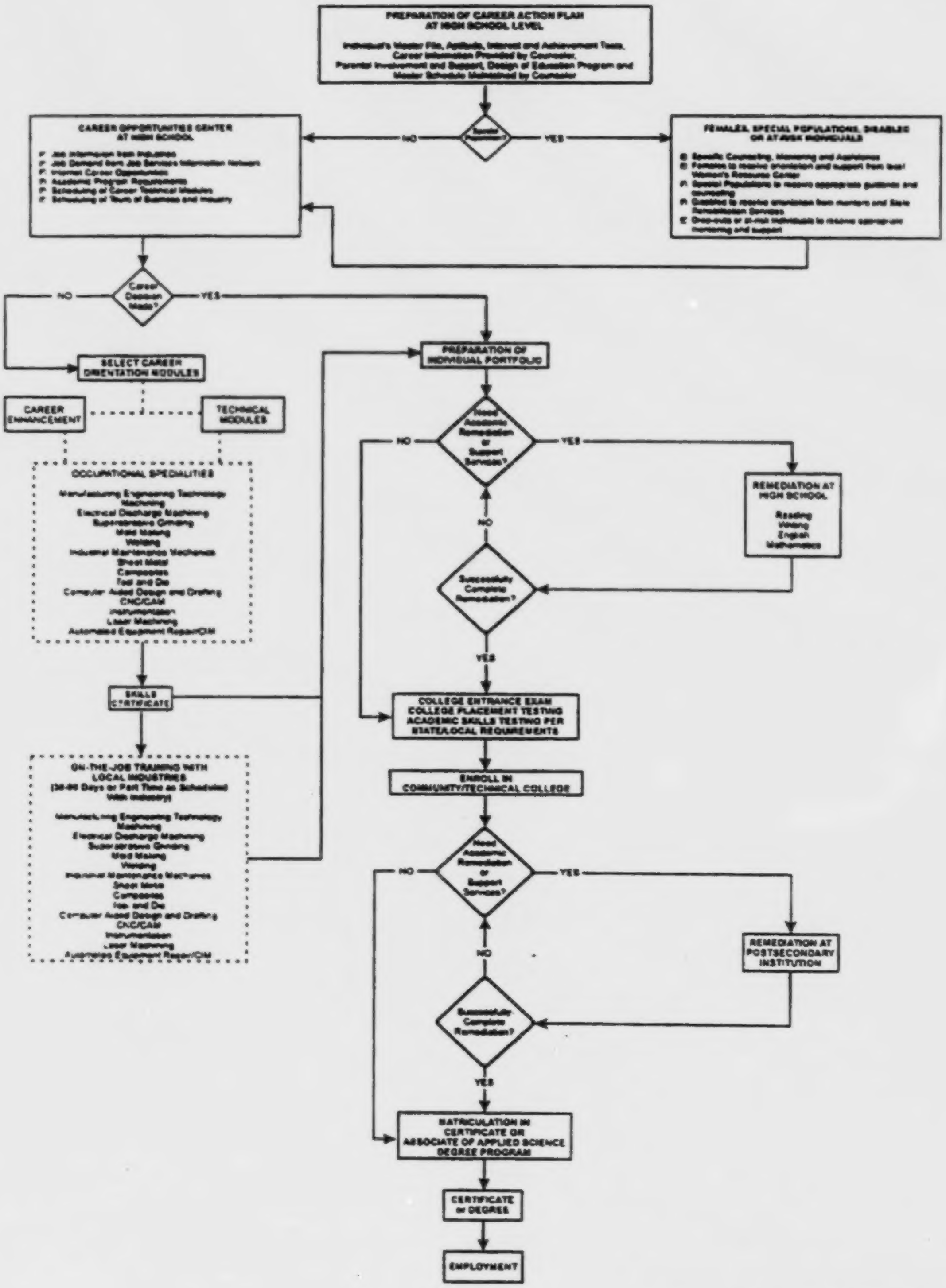
PREPARATION OF CAREER ACTION PLAN AT HIGH SCHOOL LEVEL
Individual's Master File, Aptitude, Interest and Achievement Tests, Career Information Provided by Counselor, Parental Involvement and Support, Design of Education Program and Master Schedule Maintained by Counselor
Special Population?
NO
YES
CAREER OPPORTUNITIES CENTER AT HIGH SCHOOL
Job Information from Industries
Job Demand from Job Services Information Network
Women Career Opportunities
Academic Program Requirements
Scheduling of Career Technical Modules
Scheduling of Tours of Business and Industry
FEMALES, SPECIAL POPULATIONS, DISABLED OR AT-RISK INDIVIDUALS
Specific Counseling, Mentoring and Assistance
Females to receive orientation and support from local Women's Resource Center
Special Populations to receive appropriate guidance and counseling
Disabled to receive orientation from mentors and State Rehabilitation Services
Drop-outs or at-risk individuals to receive appropriate mentoring and support
Career Decision Made?
NO
YES
SELECT CAREER ORIENTATION MODULES
CAREER ENHANCEMENT
TECHNICAL MODULES
OCCUPATIONAL SPECIALITIES
Manufacturing Engineering Technology
Machining
Electrical Discharge Machining
Superabrasive Grinding
Mold Making
Welding
Industrial Maintenance Mechanics
Sheet Metal
Composites
Tool and Die
Computer Aided Design and Drafting
CNC/CAM
Instrumentation
Laser Machining
Automated Equipment Repair/CIM
SKILLS CERTIFICATE
ON-THE-JOB TRAINING WITH LOCAL INDUSTRIES (30-90 Days or Part Time as Scheduled With Industry)
Manufacturing Engineering Technology
Machining
Electrical Discharge Machining
Superabrasive Grinding
Mold Making
Welding
Industrial Maintenance Mechanics
Sheet Metal
Composites
Tool and Die
Computer Aided Design and Drafting
CNC/CAM
Instrumentation
Laser Machining
Automated Equipment Repair/CIM
PREPARATION OF INDIVIDUAL PORTFOLIO
Need Academic Remediation or Support Services?
NO
YES
REMEDIATION AT HIGH SCHOOL
Reading
Writing
English
Mathematics
NO
Successfully Complete Remediation?
YES
COLLEGE ENTRANCE EXAM
COLLEGE PLACEMENT TESTING
ACADEMIC SKILLS TESTING PER STATE/LOCAL REQUIREMENTS
ENROLL IN COMMUNITY/TECHNICAL COLLEGE
Need Academic Remediation or Support Services?
NO
YES
REMEDIATION AT POSTSECONDARY INSTITUTION
NO
Successfully Complete Remediation?
YES
MATRICULATION IN CERTIFICATE OR ASSOCIATE OF APPLIED SCIENCE DEGREE PROGRAM
CERTIFICATE or DEGREE
EMPLOYMENT

Figure A-1

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- Academic program requirements
- Scheduling of career technical modules
- Scheduling of tours of business and industry

Of special note is the area of special populations. With precision manufacturing traditionally being a male-dominated field, females, in addition to special populations (economically disadvantaged, educationally disadvantaged, single parent/displaced homemakers, limited English proficiency, disabled and at-risk students) cannot be overlooked. Through various services within the community and institution, support services would address:

- Specific counseling, mentoring and assistance
- Females to receive orientation and support from local women's resource centers
- Special populations to receive appropriate guidance/counseling and financial support to include assistance with food, transportation, shelter, utilities, child care, medicine, etc.:
    - Department of Human Services
    - State Workforce Commission
    - Job Training Partnership Act (tuition, books, etc.)
    - Housing and Urban Development
    - Children Management Services
    - United Way, Goodwill Industries, Salvation Army, etc.
- Disabled to receive orientation from mentors and State Rehabilitation Services
- Drop-outs or at-risk students to receive appropriate mentoring and support from local and state agencies

If a career decision has not been made, the local institution will offer orientation modules (example orientation modules are included at the end of this volume) whereby undecided individuals receive a sampling of the precision manufacturing industry. These orientation modules focus on career enhancement and technical modules. Targeted populations include junior and senior year students. Curricula include basic shop tools/machine practices, basic sheet metal forming and joining practices and remediation in math, science and personal and group communications.

Moreover, specific remediation modules addressing advanced specialty area courses/modules are included in this volume of the MAST deliverables. These occupational specialities include:

- Machining (MAC)
- Manufacturing Engineering Technology (MET)
- Mold Making (MLD)
- Welding (WLD)
- Industrial Maintenance (IMM)
- Sheet Metal (SML) and Composites (COM)
- Tool and Die (TLD)
- Computer-Aided Drafting and Design (CAD)
- Computer-Aided Manufacturing and Advanced CNC (CAM/CNC)
- Instrumentation (INT)
- Laser Machining (LSR)
- Automated Equipment/Computer-Integrated Manufacturing (CIM)

Curricula completion would lead to a skills certificate and further student enlightenment as to the opportunities relative to the machine tool industry. As involvement becomes more intense, interested students may enter on-the-job-training with local industries (30-90 days or part time, as scheduled with industry) with further emphasis on the various occupational specialities, as listed above. The end result would lead to consideration of enrollment in college and/or possible entry-level employment. On-the-job training in the form of early work experiences allow the student to begin to specialize after he has had the opportunity to consider the various specialties with the machine tool industry.

With or without an on-the-job training option, the individual's personal portfolio (a history of student performance, documenting ones's progression and achievements in various areas with emphasis upon knowledge, experience and skills) is analyzed to determine the need for academic remediation and/or support service(s). If remediation is necessary, said remediation at the high school level shall address reading, writing, mathematics and English, whereby additional remediation will be contingent upon a student's pass/fail status. Additional remediation may be necessary early on in college based upon personal need or actual state requirements. For example, the State of Texas requires the completion of a testing instrument called the *Texas Academic Skills Program (TASP)*. Prospective college students must pass the test or take remediation courses in weak areas until they pass, or they cannot continue to pursue a college degree.

Typically, secondary schools provide a direct pathway for most students, offering career information and preparation in basic academic skills. If a high school student's career decision has been initially made without the need for external guidance, the individual's personal portfolio is analyzed to determine their need for academic remediation or support service(s). If remediation is necessary, the remediation at the high school level shall address reading, writing, mathematics and English, whereby additional remediation will be contingent upon a student's pass/fail status. Hopefully that remediation is heavy on technical math.

If the high school portfolio does not reflect a need for academic remediation and/or additional support service(s), they would directly enroll in a community/technical college machining certificate/associate degree program.

UNEMPLOYED, OUT-OF-SCHOOL AND DISPLACED WORKERS

A career action plan flowchart follows as Figure B-1 for unemployed, out-of-school and displaced workers. The following discussion concerning the preparation of a career action plan is outlined in that chart. This plan would be addressed during their initial visits to the college campus.

Once an individual exits high school, they may be classified as unemployed, out-of-school or displaced. Career decisions, at this point, may be influenced by:

UNEMPLOYED, OUT-OF-SCHOOL AND DISPLACED WORKERS

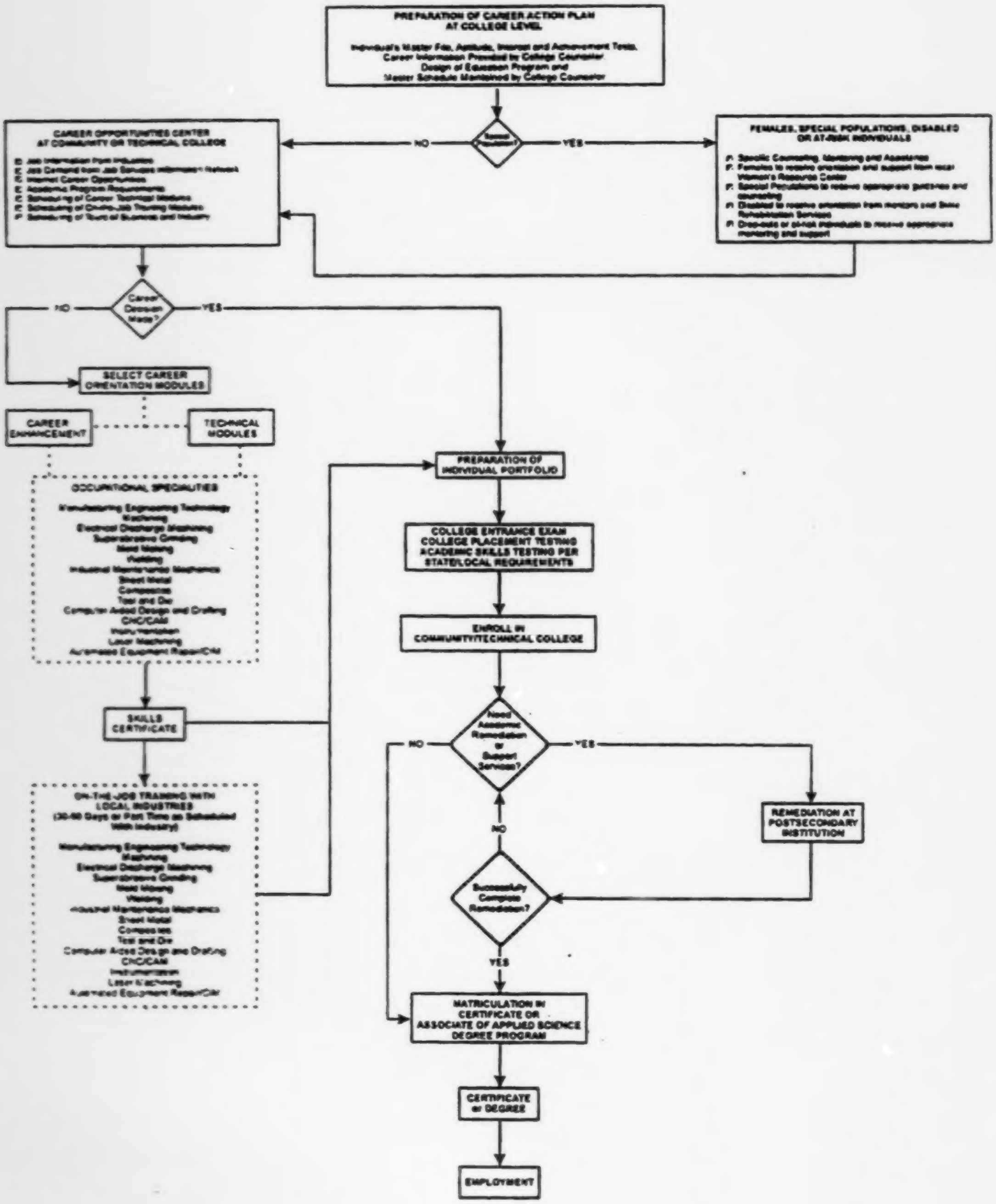
PREPARATION OF CAREER ACTION PLAN AT COLLEGE LEVEL
Individual's Master File, Aptitude, Interest and Achievement Tests,
Career Information Provided by College Counselor
Design of Education Program and
Master Schedule Maintained by College Counselor
Special Population?
NO
YES
CAREER OPPORTUNITIES CENTER AT COMMUNITY OR TECHNICAL COLLEGE
Job Information from Industries
Job Demand from Job Services Information Network
Internal Career Opportunities
Academic Program Requirements
Scheduling of Career Technical Modules
Scheduling of On-the-Job Training Modules
Scheduling of Tours of Business and Industry
FEMALES, SPECIAL POPULATIONS, DISABLED OR AT-RISK INDIVIDUALS
Specific Counseling, Mentoring and Assistance
Females to receive orientation and support from local Women's Resource Center
Special Populations to receive appropriate guidance and counseling
Disabled to receive orientation from mentors and State Rehabilitation Services
Drop-outs or at-risk individuals to receive appropriate mentoring and support
Career Decision Made?
NO
YES
SELECT CAREER ORIENTATION MODULES
CAREER ENHANCEMENT
TECHNICAL MODULES
OCCUPATIONAL SPECIALTIES
Manufacturing Engineering Technology
Machining
Electrical Discharge Machining
Superabrasive Grinding
Mold Making
Welding
Industrial Maintenance Mechanics
Sheet Metal
Composites
Tool and Die
Computer Aided Design and Drafting
CNC/CAM
Instrumentation
Laser Machining
Automated Equipment Repair/CIM
SKILLS CERTIFICATE
ON-THE-JOB TRAINING WITH LOCAL INDUSTRIES
(30-90 Days or Part Time as Scheduled With Industry)
Manufacturing Engineering Technology
Machining
Electrical Discharge Machining
Superabrasive Grinding
Mold Making
Welding
Industrial Maintenance Mechanics
Sheet Metal
Composites
Tool and Die
Computer Aided Design and Drafting
CNC/CAM
Instrumentation
Laser Machining
Automated Equipment Repair/CIM
PREPARATION OF INDIVIDUAL PORTFOLIO
COLLEGE ENTRANCE EXAM
COLLEGE PLACEMENT TESTING
ACADEMIC SKILLS TESTING PER STATE/LOCAL REQUIREMENTS
ENROLL IN COMMUNITY/TECHNICAL COLLEGE
Need Academic Remediation or Support Services?
NO
YES
REMEDIATION AT POSTSECONDARY INSTITUTION
NO
Successfully Complete Remediation?
YES
MATRICULATION IN CERTIFICATE OR ASSOCIATE OF APPLIED SCIENCE DEGREE PROGRAM
CERTIFICATE or DEGREE
EMPLOYMENT

Figure B-1

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- Individual's personal master file/profile
- Aptitude
- Interest
- Achievement tests
- Career information provided by college counselor
- Design of educational program
- Master schedule maintained by college counselor

Further direction can be attained by investigating a career opportunities center at the local community or technical college. Informational sources include:

- Career information from industries
- Job demand from Job Services Information Network
- Internet career opportunities
- Academic program requirements
- Scheduling of career technical modules
- Scheduling of on-the-job training modules
- Scheduling of tours of business and industry

Females, special populations, disabled and at-risk individuals are of particular interest. With the workforce becoming highly diversified, specific needs of these targeted individuals must be met in order for recruitment of this group to be successful. Support services within the community and institution would provide:

- Specific counseling, mentoring and assistance
- Females to receive orientation and support from local women's resource centers
- Special populations to receive appropriate guidance/counseling and financial support to include assistance with food, transportation, shelter, utilities, child care, medicine, etc.:
    - Department of Human Services
    - State Workforce Commission
    - Job Training Partnership Act (tuition, books, etc.)
    - Housing and Urban Development
    - Children Management Services
    - United Way, Goodwill Industries, Salvation Army, etc.
- Disabled to receive orientation from mentors and State Rehabilitation Services
- Drop-outs or at-risk individuals to receive appropriate mentoring and support

If a career decision has not been made, the local institution will offer orientation modules (included in this volume) whereby undecided individuals receive an orientation of the machine tool industry. These modules should focus on career enhancement and basic technical information. Targeted populations include those unemployed, out-of-school and displaced workers who are needing additional career guidance.

Advanced specialty area courses/modules at the postsecondary level concerning occupational specialties are available in Volume 3-14 of the MAST deliverables and include:

- Machining (MAC)
- Manufacturing Engineering Technology (MET)
- Mold Making (MLD)

- Welding (WLD)
- Industrial Maintenance (IMM)
- Sheet Metal (SML) and Composites (COM)
- Tool and Die (TLD)
- Computer-Aided Drafting and Design (CAD)
- Computer-Aided Manufacturing and Advanced CNC (CAM/CNC)
- Instrumentation (INT)
- Laser Machining (LSR)
- Automated Equipment/Computer-Integrated Manufacturing (CIM)

Successful completion would lead to a skills certificate and further consideration relative to the opportunities of the machining industry. Moreover, interested persons may enter on-the-job training with local industries (30-90 days or part time, as scheduled with industry) further emphasizing the various occupational specialities, as listed above, which may lead to further specialization and an associate degree.

CURRENTLY EMPLOYED WORKERS UPGRADING JOB SKILLS

A career action plan flowchart follows as Figure C-1 for currently employed workers upgrading job skills. The following discussion concerning the preparation of a career action plan at the college level is keyed to that illustration.

The technological revolution has necessitated the need for individuals and existing workers to be trained in new frontiers that are required for economic survival and growth. Delivery of new technologically up-to-date machines require the operator to be fully trained to take advantage of the capabilities of that new machine. The speeds, feeds and automated cutting and grinding processes available on a new machine, or a set of devices all operated by one man is extraordinary. The cost savings associated with training the operator to handle the new equipment is tremendous. Educational institutions and industry must aid in producing and supporting a more highly skilled employee.

A currently employed individual may be sponsored by his company for on-site training at the shop/plant, or could attend classes on campus either on his own or with company support. A Remote Site/Industrial Training Model is enclosed in this volume to help technical colleges prepare for collaborations and contracts with industries for credit or non-credit training.

Employers increasingly depend on people who can put knowledge to work. The opportunities for an individual with a good, solid technical base to expand can be located by:

CURRENTLY EMPLOYED WORKERS UPGRADING JOB SKILLS

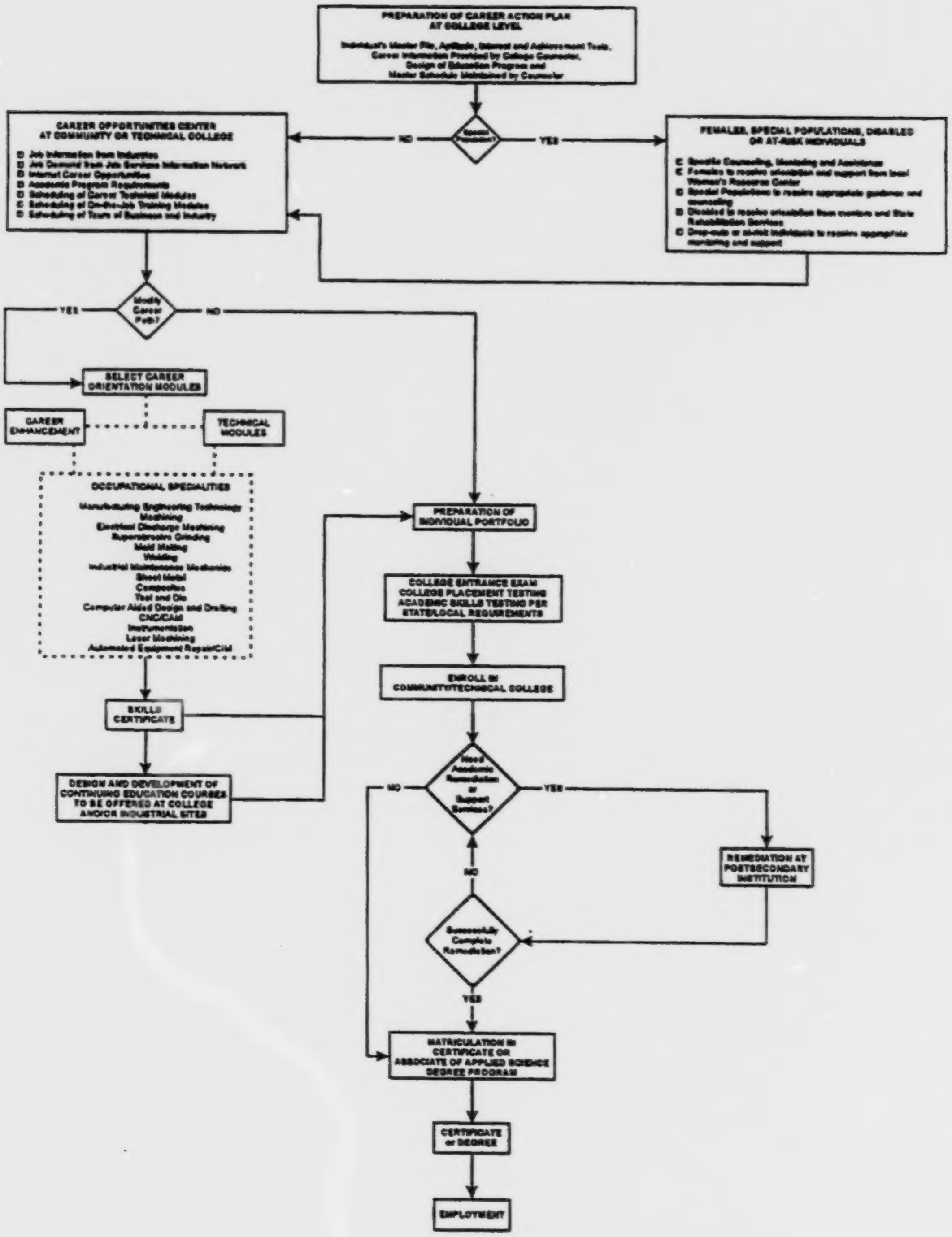
PREPARATION OF CAREER ACTION PLAN AT COLLEGE LEVEL
Individual's Master File, Aptitude, Interest and Achievement Tests, Career Information Provided by College Counselor, Design of Education Program and Master Schedule Maintained by Counselor
Special Population?
NO
YES
CAREER OPPORTUNITIES CENTER AT COMMUNITY OR TECHNICAL COLLEGE
Job Information from Industries
Job Demand from Job Services Information Network
Internet Career Opportunities
Academic Program Requirements
Scheduling of Career Technical Modules
Scheduling of On-the-Job Training Modules
Scheduling of Tours of Business and Industry
FEMALES, SPECIAL POPULATIONS, DISABLED OR AT-RISK INDIVIDUALS
Specific Counseling, Mentoring and Assistance
Females to receive orientation and support from local Women's Resource Center
Special Populations to receive appropriate guidance and counseling
Disabled to receive orientation from mentors and State Rehabilitation Services
Drop-outs or at-risk individuals to receive appropriate mentoring and support
Modify Career Path?
YES
NO
SELECT CAREER ORIENTATION MODULES
CAREER ENHANCEMENT
TECHNICAL MODULES
OCCUPATIONAL SPECIALITIES
Manufacturing Engineering Technology
Machining
Electrical Discharge Machining
Superabrasive Grinding
Mold Making
Welding
Industrial Maintenance Mechanics
Sheet Metal
Composites
Tool and Die
Computer Aided Design and Drafting
CNC/CAM
Instrumentation
Laser Machining
Automated Equipment Repair/CIM
SKILLS CERTIFICATE
DESIGN AND DEVELOPMENT OF CONTINUING EDUCATION COURSES TO BE OFFERED AT COLLEGE AND/OR INDUSTRIAL SITES
PREPARATION OF INDIVIDUAL PORTFOLIO
COLLEGE ENTRANCE EXAM COLLEGE PLACEMENT TESTING ACADEMIC SKILLS TESTING PER STATE/LOCAL REQUIREMENTS
ENROLL IN COMMUNITY/TECHNICAL COLLEGE
Need Academic Remediation or Support Services?
NO
YES
REMEDIATION AT POSTSECONDARY INSTITUTION
NO
Successfully Complete Remediation?
YES
MATRICULATION IN CERTIFICATE OR ASSOCIATE OF APPLIED SCIENCE DEGREE PROGRAM
CERTIFICATE or DEGREE
EMPLOYMENT

Figure C-1

BEST COPY AVAILABLE

- Career information from industries
- Job demand from Job Services Information Network
- Internet career opportunities
- Review academic program requirements

Careers in precision manufacturing have traditionally been oriented toward the male population. Females, special populations, disabled and at-risk individuals, with the desire to upgrade their job skills, will find support services to encompass:

- Specific counseling, mentoring and assistance
- Females to receive orientation and support from local women's resource centers
- Special populations to receive appropriate guidance/counseling and financial support to include assistance with food, transportation, shelter, utilities, child care, medicine, etc.:
    - Department of Human Services
    - State Workforce Commission
    - Job Training Partnership Act (tuition, books, etc.)
    - Housing and Urban Development
    - Children Management Services
    - United Way, Goodwill Industries, Salvation Army, etc.
- Disabled to receive orientation from mentors and State Rehabilitation Services
- Drop-outs or at-risk individuals to receive appropriate mentoring and support

Advanced specialty area courses/modules at the postsecondary level concerning occupational specialties are available in Volumes 3-14 of the MAST deliverables and incorporate:

- Machining (MAC)
- Manufacturing Engineering Technology (MET)
- Mold Making (MLD)
- Welding (WLD)
- Industrial Maintenance (IMM)
- Sheet Metal (SML) and Composites (COM)
- Tool and Die (TLD)
- Computer-Aided Drafting and Design (CAD)
- Computer-Aided Manufacturing and Advanced CNC (CAM/CNC)
- Instrumentation (INT)
- Laser Machining (LSR)
- Automated Equipment/Computer-Integrated Manufacturing (CIM)

Individuals desiring additional upgrading may enroll in specific precision manufacturing enhancement courses offered through continuing education classes at the local college and/or industrial site. Interest in this field may lead to entrance into college in a formal industrial technology degree plan and/or possible employment.

CAREER ORIENTATION MODULES

MANUFACTURING TECHNOLOGIES ORIENTATION

180 Hours of Self-Paced Career Orientation Modules
for the Precision Manufacturing Occupations

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Manufacturing Technologies Orientation

Orientation 1

Section A ---Introduction - 2 hrs 2

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- Unit 2, Mechanical Hardware - 8 hrs. 4
- Unit 3, Reading Drawings - 8 hrs. 5

Section B --- Hand Tools - 2 hrs 6

- Unit 1, Arbor and Shop Presses - 12 hrs. 7
- Unit 2, Work-Holding and Hand Tools - 6 hrs. 8
- Unit 3, Hacksaws - 4 hrs. 9
- Unit 4, Files - 8 hrs. 10
- Unit 5, Hand Reamers - 8 hrs. 11
- Unit 6, Identification and Uses of Taps - 12 hrs. 12
- Unit 7, Tapping Procedures - 12 hrs. 13
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Section C --- Dimensional Measurement - 4 hrs 16

- Unit 1, Systems of Measurement - 6 hrs. 17
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- Unit 4, Using Micrometer Instruments - 8 hrs. 20
- Unit 5, Using Comparison Measuring Instruments - 8 hrs. 21
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- Unit 7, Using Angular Measuring Instruments - 8 hrs. 23
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Section D --- Materials - 2 hrs 25

- Unit 1, Selection and Identification of Steels - 4 hrs. 26
- Unit 2, Selection and Identification of Nonferrous Metals - 4 hrs. 27

Total 180 Hours

Manufacturing Technologies Orientation

Graduating high school seniors are at a crossroads. Most assume that they have two basic options; enter the minimum-wage, service-providing marketplace or enter a four-year college for an engineering or business degree. Few take the time to consider a career as a technician in manufacturing technology.

Most have a picture of a dirty, dark plant doing one monotonous task all day long for their entire lifetime. They would be surprised to learn that the workplace is now clean and well lit with extremely sophisticated machines that require computer literate technicians, not operators, to produce a challenging part that takes a great deal of skill and knowledge. The machine tool industry has a large, documented shortage of these skilled technicians. Properly trained technicians earn more than the average four-year college graduate, and are in demand across the country.

A technician is a vital member of the overall engineering team involved in product design, testing, and manufacturing. The technician is a graduate of an accredited one-year certificate or a two-year associate degree program in a number of fields in the precision manufacturing industry ranging from a laser machinist to a tool and die maker. The technician has been thoroughly grounded in many of the same engineering fundamentals as engineering graduates, but in a more **applied manner**. Technicians use calculus and technical math, but they quickly see its practical application to the workplace and spend less time on theory.

Many graduating seniors choose not to go to college because they picture themselves being desk bound for life. They want "hands on" challenges. A career as a technician in the precision manufacturing industry provides the challenge, the income, and the opportunities to move up in the business.

This 180-Hour Orientation Module is designed to give the person at their crossroads in life an opportunity to review a career as a manufacturing technician. It is a self-paced, general instruction guide in basic shop tools and machining practices to give the student an opportunity to preview the field within this industry. Although self-paced, secondary schools should appoint a guidance counselor or shop instructor to help administer the program. In addition, the MAST Career Orientation video should also be reviewed prior to the start of this 180-hour module. The module is designed around basic hand tools. No power tools or equipment is required. The program; however, could be modified to enhance the orientation if these are available. We would only add the precaution that a qualified instructor would be necessary if the program includes actual machine cutting, grinding, turning, or joining equipment.

This Basic Shop Tools and Machining Practices course serves as a portion of the MAST deliverables. This course is designed as a career enhancement tool for high school students to be used in a self-paced instructional environment. The course content deals with topics of basic information on shop safety, mechanical hardware, reading drawings and materials used in machine tool practices. This course was developed by MACHINE TOOL ADVANCED SKILLS TECHNOLOGY (MAST) and any opinions, findings, conclusions, or recommendations expressed in this material are those of the MACHINE TOOL ADVANCED SKILLS TECHNOLOGY (MAST) consortium and do not necessarily reflect the views of the U.S. Department of Education.

SECTION A

INTRODUCTION

TEXT: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.

SUBJECT: Section A --- Introduction

OBJECTIVE: After completing this unit, you should be able to identify the different career opportunities in machining and related areas.

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Section A --- Introduction, page 1-5
2. Identify the professional machining career that would be of interest to you

MATERIALS:

1. Student text

LENGTH: Approximately 2 hours

SECTION A

UNIT 1, SHOP SAFETY

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices. fifth edition 1995.

SUBJECT: Section A --- Unit 1, Shop Safety

OBJECTIVES: After completing this unit, you should be able to:

1. Identify common shop hazards
2. Identify and use common shop safety equipment

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 1, Shop Safety, page 5-13
2. Complete the Self-Test on page 13 with 100% accuracy
3. Successfully pass the Post Test on Unit 1, Shop Safety

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 4 hours

SECTION A

UNIT 2, MECHANICAL HARDWARE

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section A --- Unit 2, Mechanical Hardware

OBJECTIVES: After completing this unit, you should be able to:

1. Identify treads and threaded fasteners
2. Identify tread nomenclature on drawings
3. Discuss standard series of threads
4. Identify and describe applications of common mechanical hardware found in the machine shop

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 2, Mechanical Hardware, page 14-27
2. Complete the Self-Test on page 27 with 100% accuracy
3. Successfully pass the Post Test on Unit 2, Introduction to Mechanical Hardware

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 8 hours

SECTION A

UNIT 3, READING DRAWINGS

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section A --- Unit 3, Reading Drawings

OBJECTIVE: After completing this unit, you should be able to:

1. Read and interpret common detail drawings found in the machine shop

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 3, Reading Drawings, page 28-36
2. Complete the Self-Test on page 36 with 100% accuracy
3. Successfully pass the Post Test on Unit 3, Reading Shop Drawings

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 8 hours

SECTION B

HAND TOOLS

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.

SUBJECT: Section B --- Hand Tools

OBJECTIVE: After completing this unit, you should be able to:

1. Understand the importance of hand tools and their purpose

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Section B --- Hand Tools, page 37-38
2 Understand the importance of hand tool safety

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text

LENGTH: Approximately 2 hours

SECTION B

UNIT 1, ARBOR AND SHOP PRESSES

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section B — Unit 1, Arbor and Shop Presses

OBJECTIVES: After completing this unit, you should be able to:

1. Install and remove a bronze bushing using an arbor press
2. Press on and remove a ball bearing from a shaft on an arbor press using the correct tools
3. Press on and remove a ball bearing from a housing using an arbor press and correct tooling
4. Install and remove a mandrel using an arbor press
5. Install and remove a shaft with key in a hub using the arbor press

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 1, Arbor and Shop Presses, page 38-45
2. Complete the Self-Test on page 45 with 100% accuracy
3. Successfully pass the Post Test on Unit 1, Arbor and Shop Presses

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 12 hours

SECTION B

UNIT 2, WORK-HOLDING AND HAND TOOLS

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section B --- Unit 2, Work-Holding and Hand Tools

OBJECTIVES: After completing this unit, you should be able to:

1. Identify various types of vises, their uses, and maintenance
2. Identify the proper tool for given job
3. Determine the correct use of a selected tool

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 2, Work-Holding and Hand Tools, page 46-55
2. Complete the Self-Test on page 54 and 55 with 100% accuracy
3. Successfully pass the Post Test on Unit 2, Noncutting Hand Tools

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 6 hours

SECTION B

UNIT 3, HACKSAWS

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section B --- Unit 3, Hacksaws

OBJECTIVES: After completing this unit, you should be able to:
1. Identify, select, and use hand hacksaws

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 3, Hacksaws, page 55-58
2. Complete the Self-Test on page 57 and 58 with 100% accuracy
3. Successfully pass the Post Test on Unit 3, Hacksaws

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 4 hours

SECTION B

UNIT 4, FILES

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th. ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section B --- Unit 4, Files

OBJECTIVES: After completing this unit, you should be able to:
1. Identify eight common files and some of their uses

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 4, Files, page 58-64
2. Complete the Self-Test on page 64 with 100% accuracy
3. Successfully pass the Post Test on Unit 4, Files and Off-Hand Grinding

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 8 hours

SECTION B

UNIT 5, HAND REAMERS

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section B — Unit 5, Hand Reamers

OBJECTIVES: After completing this unit, you should be able to:

1. Identify at least five types of hand reamers
2. Hand ream a hole to a specified size

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 5, Hand Reamers, page 64-68
2. Complete the Self-Test on page 68 with 100% accuracy
3. Successfully pass the Post Test on Unit 5, Hand Reamers

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 8 hours

SECTION B

UNIT 6, IDENTIFICATION AND USES OF TAPS

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section B --- Unit 6, Identification and Uses of Taps

OBJECTIVES: After completing this unit, you should be able to:

1. Identify common taps
2. Select taps for specific applications

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 6, Identification and Uses of Taps, page 68-74
2. Complete the Self-Test on page 73 and 74 with 100% accuracy
3. Successfully pass the Post Test on Unit 6, Taps, Identification and Application

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 12 hours

SECTION B

UNIT 7, TAPPING PROCEDURES

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section B --- Unit 7, Tapping Procedures

OBJECTIVES: After completing this unit, you should be able to:

1. Select the correct tap drill for a specific percentage of thread
2. Determine the cutting speed for a given work material --- tool combination
3. Select the correct cutting fluid for tapping
4. Tap holes by hand or with a drill press
5. Identify and correct common tapping problems

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 7, Tapping Procedures, page 74-79
2. Complete the Self-Test on page 79 with 100% accuracy
3. Successfully pass the Post Test on Unit 7, Tapping Procedures

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 12 hours

SECTION B

UNIT 8, THREAD-CUTTING DIES AND THEIR USES

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section B --- Unit 8, Thread-Cutting Dies and Their Uses

OBJECTIVES: After completing this unit, you should be able to:

1. Identify dies used for hand threading
2. Select and prepare a rod for threading
3. Cut threads with a die

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 8, Tread-Cutting Dies and Their Uses, page 80-84
2. Complete the Self-Test on page 83 and 84 with 100% accuracy
3. Successfully pass the Post Test on Unit 8, Tread-Cutting Dies and Their Uses

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 10 hours

SECTION B

UNIT 9, OFF-HAND GRINDING

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section B --- Unit 9, Off-Hand Grinding

OBJECTIVES: After completing this unit, you should be able to:
1. Describe setup, use, and safety of the pedestal grinder

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 9, Off-Hand Grinding, page 84-88
2. Complete the Self-Test on page 88 with 100% accuracy
3. Successfully pass the Post Test on Unit 9, Off-Hand Grinding

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 8 hours

SECTION C

DIMENSIONAL MEASUREMENT

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.

SUBJECT: Section C --- Dimensional Measurement

OBJECTIVES: After completing this unit, you should be able to:

1. Define measurement
2. Identify some of the measurement needs of the Machinist
3. Define metrology
4. Define accuracy
5. Define precision
6. Define reliability
7. What does discrimination refer to
8. Define calibration
9. Know what the common expression "the measurement is right on" means
10. Identify ten measuring instruments that are available to a machinist

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Section C, Dimensional Measurement, page 89-107

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text

LENGTH: Approximately 4 hours

SECTION C

UNIT 1, SYSTEMS OF MEASUREMENT

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section C --- Unit 1, Systems of Measurement

OBJECTIVES: After completing this unit, you should be able to:

1. Identify common methods of measurement conversion
2. Convert inch dimensions to metric equivalents and convert metric dimensions to inch equivalents

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 1, Systems of Measurement, page 108-112
2. Complete the Self-Test on page 112 with 100% accuracy
3. Successfully pass the Post Test on Unit 1, Systems of Measurement

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 6 hours

SECTION C

UNIT 2, USING STEEL RULES

TEXTS:	MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995. Instructor's Manual for Machine Tool Practices, fifth edition 1995.
SUBJECT:	Section C — Unit 2, Using Steel Rules
OBJECTIVES:	After completing this unit, you should be able to: 1. Identify various kinds of rules and their applications 2. Apply rules in typical machine shop measurements

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 2, Using Steel Rules, page 113-121
2. Complete the Self-Test on page 121 with 100% accuracy
3. Successfully pass the Post Test on Unit 2, Using Steel Rules

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Rule Measuring Kit
4. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 4 hours

SECTION C

UNIT 3, USING VERNIER, DIAL, AND DIGITAL INSTRUMENTS FOR DIRECT MEASUREMENTS

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section C --- Unit 3, Using Vernier, Dial, and Digital Instruments for Direct Measurements

OBJECTIVES: After completing this unit, you should be able to:

1. Measure and record dimensions to an accuracy of plus or minus .001 in. with a vernier caliper
2. Measure and record dimensions to an accuracy of plus or minus .02 mm using a metric vernier caliper
3. Measure and record dimensions using a vernier depth gage.

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 3, Using Vernier, Dial, and Digital Instruments for Direct Measurements, page 122-133
2. Complete the Self-Test on page 129 with 100% accuracy
3. Successfully pass the Post Test on Unit 3, Using Vernier Dial and Digital Instruments

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Inch Vernier Caliper Measuring Test Kit
4. Metric Vernier Caliper Measuring Test Kit
5. Inch Vernier Depth Gage Measuring Test Kit
6. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 12 hours

SECTION C

UNIT 4, USING MICROMETER INSTRUMENTS

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section C --- Unit 4, Using Micrometer Instruments

OBJECTIVES: After completing this unit, with the use of appropriate measuring kits, you should be able to:

1. Measure and record dimensions using outside micrometers to an accuracy of plus or minus .001 of an inch
2. Measure and record diameters to an accuracy of plus or minus .001 of an inch
3. Measure and record depth measurements using a depth micrometer to an accuracy of plus or minus .001 inch
4. Measure and record dimensions using a metric micrometer to an accuracy of plus or minus .01 mm
5. Measure and record dimensions using a vernier micrometer to an accuracy of plus or minus .0001 in. (assuming proper measuring conditions)

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 4, Using Micrometer Instruments, page 133-156
2. Complete the Self-Test on page 145, 147, 151, and 156 with 100% accuracy
3. Successfully pass the Post Test on Unit 4, Using Micrometer Instruments

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 8 hours

SECTION C

UNIT 5, USING COMPARISON MEASURING INSTRUMENTS

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section C --- Unit 5, Using Comparison Measuring Instruments

OBJECTIVES: After completing this unit, you should be able to:

1. Define comparison measurement
2. Identify common comparison measuring tools
3. Given a measuring situation, select the proper comparison tool for the measuring requirement

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 5, Using Comparison Measuring Instruments, page 157-178
2. Complete the Self-Test on page 178 with 100% accuracy
3. Successfully pass the Post Test on Unit 5, Using Comparison Measuring Instruments

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 8 hours

SECTION C

UNIT 6, USING GAGE BLOCKS

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section C — Unit 6, Using Gage Blocks

OBJECTIVES: After completing this unit, you should be able to:

1. Describe the care required to maintain gage block accuracy
2. Wring gage blocks together correctly
3. Disassemble gage block combinations and properly prepare the blocks for storage
4. Calculate combinations of gage block stacks with and without wear blocks
5. Describe gage blocks applications

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 6, Using Gage Blocks, page 178-187
2. Complete the Self-Test on page 187 with 100% accuracy
3. Successfully pass the Post Test on Unit 5, Using Gage Blocks

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 6 hours

SECTION C

UNIT 7, USING ANGULAR MEASURING INSTRUMENTS

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.

SUBJECT: Section C --- Unit 7, Using Angular Measuring Instruments

OBJECTIVES: After completing this unit, you should be able to:

1. Identify common angular measuring tools
2. Read and record angular measurements using a vernier protractor
3. Calculate sine bar elevations and measure angles using a sine bar and adjustable parallels
4. Calculate sine bar elevations and establish angles using a sine bar and gage blocks

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 7, Using Angular Measuring Instruments, page 187-195
2. Complete the Self-Test on page 195 with 100% accuracy

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text

LENGTH: Approximately 8 hours

SECTION C

UNIT 8, TOLERANCES, FITS, GEOMETRIC DIMENSIONS, AND STATISTICAL PROCESS CONTROL (SPC)

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.

SUBJECT: Section C --- Unit 8, Tolerances, Fits, Geometric Dimensions, and Statistical Process Control (SPC)

OBJECTIVES: After completing this unit, you should be able to:

1. Describe basic reasons for tolerance specifications
2. Recognize common geometric dimensions and tolerances
3. Describe the reasons for press fits and know where to find press fit allowance information
4. Describe in general terms the purpose of SPC

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 8, Tolerances, Fits, Geometric Dimensions, and Statistical Process Control (SPC), page 196-204
2. Complete the Self-Test on page 205 with 100% accuracy

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text

LENGTH: Approximately 10 hours

SECTION D

MATERIALS

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.

SUBJECT: Section D --- Materials

OBJECTIVES: After completing this unit, you should be able to:

1. Identify the raw materials used in making iron and steel
2. What are the two safety rules in lifting
3. How is hot metal identified
4. Why do you never look toward arc welding

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Section D, Materials, page 205-208

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text

LENGTH: Approximately 2 hours

SECTION D

UNIT 1, SELECTION AND IDENTIFICATION OF STEELS

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section D --- Unit 1, Selection and Identification of Steels

OBJECTIVES: After completing this unit, you should be able to:

1. Identify different types of metals by various means of shop testing

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 1, Selection and Identification of Steels, page 208-215
2. Complete the Self-Test on page 214 and 215 with 100% accuracy
3. Successfully pass the Post Test on Unit 1, Selection and Identification of Steels

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 4 hours

SECTION D

UNIT 2, SELECTION AND IDENTIFICATION OF NONFERROUS METALS

TEXTS: MACHINE TOOL PRACTICES, Kibbe, Neely, Meyer & White, Prentice Hall, 5th ed., 1995.
Instructor's Manual for Machine Tool Practices, fifth edition 1995.

SUBJECT: Section D --- Unit 2, Selection and Identification of Nonferrous Metals

OBJECTIVES: After completing this unit, you should be able to:

1. Identify and classify nonferrous metals by a numerical system
2. List the general appearance and use of various nonferrous metals

IN ORDER TO COMPLETE THIS UNIT YOU MUST:

1. Read Unit 2, Selection and Identification of Nonferrous Metals, page 215-222
2. Complete the Self-Test on page 221 and 222 with 100% accuracy
3. Successfully pass the Post Test on Unit 2, Selection and Identification of Nonferrous Metals

MATERIALS:

1. Paper
2. Pencil #2 or pen
3. Student text and Instructor's Manual for Machine Tool Practices, fifth edition 1995

LENGTH: Approximately 4 hours

EXAMPLE
INTERNSHIP AGREEMENT
Between

Enter College Name **and The** ***Enter Corporation Name***

Whereas, ***Enter College Name***, hereinafter referred to as the "COLLEGE", and the ***ENTER NAME OF CORPORATION,*** hereinafter referred to as the "CORPORATION", desiring to identify the terms and respective responsibilities of the two institutions entering into mutual participation of training ***ENTER PROGRAM TITLE*** students do hereby mutually agree to the following terms and conditions:

I. TERM AND TERMINATION:

This Agreement shall become effective when approved by the COLLEGE and CORPORATION Presidents. If approved, the Agreement shall continue in effect for a period of one (1) year after the date of execution by the COLLEGE and the CORPORATION. Either party may terminate this Agreement without cause by giving written notice of such party's intention to the COLLEGE President (on behalf of the COLLEGE) or to the CORPORATION Chief Executive Officer or CORPORATION President (on behalf of the CORPORATION), no less than fifteen (15) days prior to the date of the proposed termination. In the event the agreement is terminated, however, all students registered or enrolled in the Internship at the time of the notice shall have the opportunity to complete without interruption their respective programs or cycles. This agreement may be renewed on an annual basis by the COLLEGE President. This agreement shall bind and benefit the respective parties and their legal successors, but shall not otherwise be assignable in whole or in part, by either party without first obtaining written consent of the other party.

II. DEFAULT:

If either party shall default in this Agreement by breaching any of the covenants herein contained, the party not in default may give notice specifying the default and, if such default has not been corrected within ten (10) days, the party giving such notice may, at its option, immediately terminate this Agreement.

III. NOTICE:

All notices, demands, requests and other communications required hereunder shall be in writing and shall be deemed to have been given when personally delivered or when deposited in a regularly maintained receptacle of the United States Postal Service, postage prepaid or certified, return receipt requested, properly addressed to:

COLLEGE:
Name of College President
President
Enter College Name
Street Address
City, State, Zip Code

CORPORATION:
Name of Corporation President or CEO
Title
Company Name
Street Address
City, State, Zip Code

or at other such address as either party shall designate in writing to the other.

IV. GOVERNMENTAL IMMUNITY FROM TORT CLAIMS:

It is understood that the COLLEGE and CORPORATION, as a political subdivision of the State of __________, is protected from liability against TORT claims, except that ***Enter College Name*** does not purchase general liability insurance for litigation or potential claims against it or the CORPORATION.

V. INDEMNIFICATION:

COLLEGE and CORPORATION each agree, to the extent authorized under the Constitution and the laws of the State of __________, to indemnify and hold the other harmless from any claim, demand, suit, or loss of liability which the indemnified party may sustain as a result of the indemnifying party's breach of its duties or the indemnifying party's errors or omissions within the terms of this Agreement; provided, however, that neither party shall have any obligation or liability under this paragraph for claims, demands or causes of action arising out of the intentional or grossly negligent conduct (whether sole, joint, concurring or otherwise) of the other party, its officers, employees, agents, licensees, or invitees, or for the intentional or grossly negligent conduct of any person or entity not subject to such party's supervision or control. This indemnification shall include reasonable expenses, including attorney's fees incurred in defending such claims, and damages incurred by reason of the indemnifying, or for damages caused by the indemnifying party. As a condition precedent to asserting a right of indemnity, the party seeking indemnification shall have given the indemnifying party timely written notice of the assertion of the claim as to which the right of indemnification is claimed to exist.

VI. INSTRUCTIONAL PLANNING:

Students registered and matriculated in the COLLEGE's Associate of Applied Science ***ENTER PROGRAM TITLE*** curriculum, as designated and agreed on by the COLLEGE Program Coordinator and the Chief Executive Officer of the CORPORATION or his designee, may utilize the various departments of the CORPORATION for augmented training experience during the hours planned jointly by the Program Coordinator of the COLLEGE and the Chief Executive Officer of the CORPORATION or designee.

VII. COLLEGE RESPONSIBILITIES:

A. To develop student schedules with the CORPORATION Designee prior to entry of the student and to forward copies of each student schedule to the CORPORATION Designee.

B. To require Students and College Faculty to abide by and conform to existing rules and regulations of the CORPORATION including dress requirements and proper identification badges while in the CORPORATION.

C. To appoint a COLLEGE staff member designated as the ***ENTER PROGRAM TITLE*** Program Coordinator Designee to work with the CORPORATION Designee in developing student schedules and to act as a liaison between the COLLEGE and the CORPORATION.

D. To provide the CORPORATION Designee with "Student Evaluation Forms" prior to the completion of the Student Internship.

E. To provide appropriate orientation for all ***ENTER PROGRAM TITLE*** students prior to the starting date including assigned site location, supervisor names, hours of assignment, starting and completion dates, and attendance policy.

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F. The COLLEGE may withdraw any Student from the Internship on the basis of ill health, unsatisfactory performance, or violation of the COLLEGE Rules and Regulations.

G. To meet with the CORPORATION Designee and Student on a regular basis during the Internship for the purpose of assessing student progress. The College's ***ENTER PROGRAM TITLE*** Program Coordinator shall maintain a written record of individual student progress and completed Student Evaluation Form.

H. To administer a written and practical laboratory safety examination to all students enrolling in ***ENTER PROGRAM TITLE** Internship* and to prohibit any student from entering into the internship who does not perform satisfactorily and demonstrate satisfactory knowledge of laboratory safety procedures.

I. The COLLEGE seeks to provide equal educational opportunities without regard to race, color, religion, national origin, sex, age, or handicap. This policy extends to employment, admissions, and all programs and activities supported by the COLLEGE.

J. To require each student to sign the CORPORATION's Proprietary Information and Inventions and Noncompetition Agreement.

K. To require each student to supply the CORPORATION with a release, in form satisfactory to the CORPORATION, regarding the student's insurance coverage and release of liability.

VII. CORPORATION RESPONSIBILITIES:

A. To identify a CORPORATION Designee who shall be responsible for daily student intern assignments.

B. To require the CORPORATION Designee to prepare a written evaluation of the student's performance and achievement upon completion of the internship. The evaluation forms shall be provided by the COLLEGE.

C. To make emergency telephone calls for treatment of injuries received by student interns during the Internship hours at the expense on the student intern.

D. To report, in writing, to the COLLEGE Program Coordinator the names of any student interns that may been exposed to any hazardous materials as defined by OSHA and the nature of the exposure at the time of the probable exposure.

E. To provide adequate laboratory and conference space as may be available.

F. To provide student interns the use of instructional materials including consumable supplies as may be used in demonstration or practica at no cost to the COLLEGE or to the student.

G. To provide practical experience, participation, training, and observation of procedures and protocols in ***ENTER PROGRAM TITLE***.

H. To provide professional instruction and supervision at all times for each student during the duration of the internship.

I. The CORPORATION reserves the right to suspend any ***ENTER PROGRAM TITLE*** student determined unsatisfactory because of violation of Corporate Policy Rules and Regulations and upon review by CORPORATION and COLLEGE Coordinators the

Student may be terminated immediately from the Internship by either party if given five (5) working days written notice.

J. The CORPORATION is not required to pay compensation to any student while enrolled in the Internship. Compensation is a Corporate decision. However, the CORPORATION may choose to provide a stipend to student interns during the internship.

IX. MUTUAL RESPONSIBILITIES:

A. The COLLEGE Program Coordinator and CORPORATION Designee shall be responsible for the implementation of this agreement.

B. This contractual agreement shall be reviewed by both the CORPORATION and the COLLEGE annually and shall automatically renew unless either party desires to terminate the agreement and gives the other party fifteen (15) days written notice prior to the termination date.

C. A written modification of this agreement may be made by written request of either party with sixty (60) days advanced notification, if such modification is signed by authorized representatives of all parties to this agreement.

COMPLIANCE WITH APPLICABLE LAW:

This Agreement is subject to all State and Federal laws, ordinances, regulations, and other requirements of each governmental entity having jurisdiction as to the business of the party or the subject matter of this agreement. Venue for any cause of action arising under this agreement shall be in **ENTER CITY, COUNTY, STATE**.

This agreement, along with Appendices A, B, and C, constitutes the entire agreement of the parties with respect to the subject matter hereof, and supersedes all other proposals or prior agreements, oral or written, and all other communications, oral or written. This agreement may be amended by a written agreement signed by the authorized representatives of each party and duly authorized for execution by the COLLEGE President and CORPORATION President.

IN WITNESS WHEREOF, the parties have executed this agreement in duplicate originals on this date ________________, 199___.

Approval Signatures:

ENTER COLLEGE NAME	**ENTER CORPORATION NAME**
______________________________	______________________________
Name of COLLEGE President **COLLEGE**	**Name of CORPORATION CEO or President** **Title** **Corporation**
Approval Signatures:	
______________________________	______________________________
Name **Program Coordinator** **Program Title**	**Name of Corp. Designee** **Title** **Corporation**

APPENDIX A: DEFINITIONS

The **COLLEGE** and the **CORPORATION** agree that the following words and terms shall have the following meanings:

1. **ACADEMIC YEAR**

   The months of each year in which the **COLLEGE** offers educational program and wished to provide this Internship Agreement as part of such program.

2. **AGREEMENT**

   This agreement between **COLLEGE** and **ENTER NAME OF CORPORATION** for **ENTER PROGRAM TITLE** instruction of students at the **CORPORATION** and any renewals, amendments or addenda thereto, as may be adopted from time to time as hereinafter provided.

3. **ENTER NAME OF PROGRAM COORDINATOR**

   The Faculty member of the **COLLEGE** who has been assigned the responsibilities and duties to oversee the **ENTER PROGRAM TITLE** Curriculum.

4. **COLLEGE**

   COLLEGE with the **ENTER PROGRAM TITLE** Curriculum based at **COLLEGE** entering into this agreement.

5. **CORPORATION**

   ENTER COMPANY TITLE entering into this agreement with the **COLLEGE**.

6. **STUDENT**

   Candidates for an Associate of Applied Science Degree in **ENTER PROGRAM TITLE** at the **COLLEGE**.

7. **TERM**

   The agreement period provided for under this agreement and any renewals or addenda hereto.

8. **STIPEND**

   A fixed or regular payment or allowance.

APPENDIX B

COLLEGE agrees as follows:

1. To assign students during **CORPORATION** normal shift hours.
2. To require students to abide by any dress requirements and wear proper identification badges while in the **CORPORATION** if required or requested.
3. To require all students enrolled in the Internship to purchase professional liability insurance coverage for the minimum amount of $ 1,000,000 per occurrence and $3,000,000 annual aggregate with said liability coverage to be in effect throughout the entire internship period. **COLLEGE** shall provide the **CORPORATION** with a certificate of insurance and any amendments for each year this contract is in effect when the **CORPORATION** requests such in writing.
4. To share evaluation data derived from all aspects of this internship with the **CORPORATION** designee.
5. To require each student to complete an "Internship Evaluation Form" and "Supervisor Evaluation Form" at the completion of the internship and to submit them to the **ENTER PROGRAM TITLE** Coordinator or Designee.
6. To exercise confidentiality with regard to projects of the **CORPORATION** to the extent permitted by law.
7. To review individual Student Performance Evaluations and determine individual Student Final Grades. This shall be the responsibility of the **COLLEGE ENTER PROGRAM TITLE** Coordinator or Designee.
8. **COLLEGE** agrees to hold the **CORPORATION** harmless for any reason for termination of the agreement between the **COLLEGE** and the **CORPORATION**.

APPENDIX C

CORPORATION agrees as follows:

1. To coordinate with the **COLLEGE** the maximum number of Student Interns permitted to be assigned to the **CORPORATION** per rotation.
2. To evaluate, in writing, the assigned student intern's performance using the form provided by the **COLLEGE**.
3. To provide the student intern with copies of policies and safety manuals on the initial day of the internship and orientation to the workplace.
4. To provide a **CORPORATION** designee to work with the **COLLEGE** designee as a liaison between the **CORPORATION** and the **COLLEGE**.
5. To provide practical experience, participation, training, and observation of procedures, protocols and applications throughout the assigned internship.
6. To keep confidential from persons not parties to this contract all records pertaining to students to the extent permitted by law.

REMEDIATION COURSES

Today's young people need new and higher level skills to function effectively in contemporary society. These skills not only include the three R's- reading, writing and arithmetic - but also include higher order thinking skills, problem-solving skills, the ability to integrate and apply knowledge, and to work cooperatively with others.

Many secondary schools across the nation address these skills; some even integrate practical workplace applications to reinforce the learning process. Nearly all offer remediation of some sort in the junior and senior years, and most states have an entry level testing requirement for state supported colleges and universities, either prior to entry, or at least after a certain number of minimum course hours. The MAST Career Action Plans address these remediation processes.

Although some new students arrive with all the skills and knowledge necessary to start college, many still lack a basic platform upon which to build. This section includes that remediation designed for community and technical colleges.

Today's jobs can no longer be filled with individuals who possess only technical skills. With greater demands on the shop floor (computer control, smart machines, team management, and greater emphasis on quality), the worker of today must possess greater communication, reading, writing, and mathematic skills than his counterpart 10 to 20 years ago.

MAST has identified a tremendous void between where workers "need to be" and where entry-level young people "really are." To become part of the solution to this ever-growing problem, MAST project staffs have worked with industry and faculty (secondary and postsecondary) to develop this collection of remediation courses. Many courses have been pilot tested and have proven to raise the basic reading, writing and communication skills of the students who have taken these courses.

MAST realizes that a student who enrolls in and passes these courses will certainly not have all of the skills required for successful employment. However, they will have placed themselves in a position to continue to grow and learn for years in the future.

These courses are intended to be used for simply "taking up the slack" in what students have learned in the past and what they need to survive in today's workplace.

Each of these courses includes "SCANS" activities which have been identified by the Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor. The Secretary's Commission has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities needed for solid job performance.

Our goal, in presenting these remediation courses, is that they may be used as a resource for training and equipping a better, smarter workforce.

REMEDIATION COURSES

Course	Title	Credit Hours
READING	Adult Literacy Program	3
READING	College Preparatory Reading I	3
READING	College Preparatory Reading II	3
ENGLISH	Writing Skills I	2
ENGLISH	Writing Skills II	3
MATH	Basic Mathematics	3
MATH	Beginning Algebra I	3
MATH	Beginning Algebra II	3

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*T*echnology Program

MAST

COURSE SYLLABUS

ADULT LITERACY PROGRAM
(REMEDIATION)

MAST PROGRAM
COURSE SYLLABUS
ADULT LITERACY PROGRAM

Lecture hours/week: 1 **Lab hours/week: 6** **Credit hours: 3**

COURSE DESCRIPTION:

A comprehensive language arts literacy program for adults with significant reading difficulties and dyslexic characteristics. Emphasis is on decoding, comprehension, and structure of the written language. Additional components include cursive writing, spelling, and written expression.

PREREQUISITES: **Entry is by placement and/or diagnostic testing instruments or by referral of the counseling staff.**

REQUIRED COURSE MATERIALS:

Recommended Textbook: Texas Scottish Rite Hospital Literacy Program (Dallas, Texas), Educators Publishing Services, Inc., Cambridge, Massachusetts.

Workbook 1	Lessons 1-25
Workbook 2	Lessons 26-60
Workbook 3	Lessons 61-100
Workbook 4	Lessons 101-160

Supplies: Linkage Paper (81/2" x 14"), 35 sheets per pad
Student kit (includes alphabet letters, colored cubes, and pencil grips)

COURSE OBJECTIVES:

The student will:

- decode written language through word attack skills by using phonological awareness, structural analysis, and contextual clues;
- determine word origins and word history through the use of a dictionary;
- identify the main idea and supporting details;
- sequence events correctly;
- identify and perceive cause and effect relationships;
- evaluate and make critical analysis of given information;
- infer and draw logical conclusions;
- make generalizations;
- predict future events and outcomes;
- follow written directions involving subordinate steps;
- use parts of a book;
- use reading aids;
- use graphic sources;
- use standard reference books;

- apply the correct formation of letters in cursive writing; and
- express thoughts in writing.

LECTURE (CONTENT)

This course contains 160 videotape lessons with students responding to the lessons as instructed by the therapist on the tape. The attending teacher has a leadership/supervisory role and is responsible for program sequencing, record keeping, and maintaining an environment that is conducive to learning.

Total Lecture Hours 12

LABORATORY (CONTENT)

Students are scheduled for six hours of laboratory instruction each week throughout the quarter semester.

Daily Lesson Plans: (Lessons 1-100)

Alphabet and Sound System
New Learning (Work Attack)
Reading
Handwriting (Lesson 1-50)
Spelling
Review
Listening Comprehension

Daily Lesson Plans: (Lessons 101-135)

Dictionary and Reference Skills
New Learning
Reading
Spelling (high frequency and learned words)
Review
Reading Comprehension

Daily Lesson Plans: (Lessons 136-160)

Closure and Practice
Reading
Spelling with Writing
Spelling with common words
Writing
Review
Reading Comprehension

Total Lab Hours 72

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. **COMPETENCIES**
   - *A.* ***Resources:** Identifies, organizes, plans, and allocates resources*
      1. follows a schedule to complete assigned tasks on time
      2. requests appropriate sequential video tapes and materials as required
      3. provides self-evaluation of progress through student workbooks
   - *B.* ***Interpersonal:** Works with others*
      1. works with diversity through interaction with class members of varied ethnic, religious, and social backgrounds
   - *C.* ***Information:** Acquires and uses information*
      1. completes assignments in workbooks and evaluates individual performance
      2. completes sequential workbook assignments
      3. interprets workbook assignments and communicates through individual and group participation

II. **FOUNDATION SKILLS**
   - *A.* ***Basic Skills:** Reads, writes, performs arithmetic and mathematical operations, listens, and speaks.*
      1. ***Reading:** Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
         - a. reads and interprets appropriate level material within a self-paced program
         - b. interprets reading assignments
         - c. interprets graphical information
      2. ***Writing:** Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
         - a. completes required reading assignments
         - b. takes class notes
      3. ***Listening:** Receives, attends to, interprets, and responds to verbal messages and other cues*
         - a. responds to verbal messages
         - b. confirms verbal message interpretations with instructor and peers
         - c. makes appropriate behavior responses to verbal messages
         - d. participates in discussion and identification of the difference between listening and hearing

4. ***Speaking*:** Organizes ideas and communicates orally
  a. participates in classroom discussions
  b. organizes ideas and communicates specific questions to the instructor
  c. verbally affirms understanding of a concept, procedure, or required skill

B. ***Thinking Skills:* *Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.***
1. ***Creative Thinking***: *Generates new ideas*
  a. participates in the "brain-storming" process
  b. participates in group problem solving process
  c. practices the team approach to problem solving
2. ***Decision Making:*** *Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
  a. identifies personal goals
  b. identifies actions required to accomplish personal goals
3. ***Problem Solving:*** *Recognizes problems and devises and implements plan of action*
  a. makes daily accommodations to stay on schedule
  b. seeks additional instruction/clarification for assignment completion
  c. balances social and academic life/responsibilities
  d. accepts responsibility
4. ***Seeing Things In the Mind's Eye:*** *Organizes and processes symbols, pictures, graphs, objects, and other information*
  a. interprets non-verbal communication in the classroom

C. ***Personal Qualities:*** *Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*
1. ***Responsibility:*** *Exerts a high level of effort and perseveres towards goal attainment*
  a. attends class and completes daily course requirements
2. ***Self-Esteem:*** *Believes in own self-worth and maintains a positive view of self*
  a. instructor provides positive reinforcement and feedback permitting a positive projection of self
3. ***Sociability:*** *Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
  a. develops effective communication across cultures
  b. interacts with peers and listens effectively and provides constructive criticism
4. ***Self-Management:*** *Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
  a. monitors/assesses personal goal progress
5. ***Integrity/Honesty:*** *Chooses ethical courses of action*
  a. meets specific criteria standards to successfully complete the course
  b. encouraged to accept ethical and honest courses of action set by example

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*T*echnology Program

MAST

COURSE SYLLABUS

COLLEGE PREPARATORY READING I
(REMEDIATION)

MAST PROGRAM
COURSE SYLLABUS
COLLEGE PREPARATORY READING I

Lecture hours/week: 2 **Lab hours/week: 3** **Credit hours: 3**

COURSE DESCRIPTION:

An introductory course designed to prepare students to meet entry-level requirements for certificate and associate degree programs. Course objectives emphasize skill development and/or refinement in literal, interpretive, and evaluative comprehension; vocabulary; reading rate; and application of study skills to reading assignments. Independent lab study reinforces the lecture component.

PREREQUISITES: **Entry is by placement and/or diagnostic testing instruments, completion of the Adult Literacy Program, or by referral of the counseling staff.**

REQUIRED COURSE MATERIALS:

Recommended Textbook: Ten Steps to Building College Reading Skills, Langan, John and Broderick, Bill, 2nd ed., New Jersey: Townsend Press, 1993

Supplies:
Standard lined notebook paper
# 2 pencils
one package of scantrons

COURSE OBJECTIVES:

VOCABULARY:
The student will demonstrate the ability to:
- use context clues to determine the meaning of a word with multiple meanings;
- use context clues within a paragraph or longer unit of writing to determine the meaning of an unfamiliar word; and
- use context within a paragraph or longer unit of writing to determine the meaning of a figurative expression.

COMPREHENSION:
The student will demonstrate the ability to:
- identify the topic of a paragraph or longer unit of writing;
- identify the stated main idea of a paragraph or longer unit of writing;
- identify a summary of the stated main idea within a paragraph or longer unit of writing; and

- recognize ideas that support, exemplify, or expound the main idea in a paragraph or longer unit of writing.

AUTHOR'S INTENT:
The student will demonstrate the ability to:

- recognize the author's purpose for writing;
- evaluate the relevance of written material for a specific purpose or audience;
- evaluate the context, word choice, and phrasing in a reading selection to determine the opinions and attitudes of an author;
- identify a summary of the intended meaning of a section of material in a reading selection; and
- recognize the intended emotional effect that an author's choice or use of words has on the reader.

ORGANIZATION OF IDEAS:
The student will demonstrate the ability to:

- determine the purpose of a definition and example organizational pattern in a reading selection;
- identify transitional words/phrases in defining or explaining a specialized term, phrase, or idea in a reading selection;
- determine the purpose of a time order organizational pattern in a reading selection;
- identify transitional words/phrases in determining time order in a reading selection;
- identify the sequence of steps in technical, scientific, and research-related material;
- determine the purpose of a spatial order organizational pattern in a reading selection;
- identify transition words/phrases in determining spatial order in a reading selection;
- determine the purpose of an order of importance organizational pattern in a reading selection;
- identify transition words/phrases in determining order of importance in a reading selection;
- determine the purpose of a comparison organizational pattern in a reading selection;
- identify transition words/phrases in determining the similarities in two or more ideas, events, or things in a reading selection;
- determine the purpose of a contrast organizational pattern in a reading selection;
- identify transition words/phrases in analyzing relationships between ideas in opposition in a reading selection;
- determine the purpose of a simple listing organizational pattern in a reading selection;
- identify transition words/phrases in determining a simple listing pattern in a reading selection;
- determine the purpose of cause-effect organizational pattern in a reading selection;
- identify transition words/phrases in determining a cause-effect relationship in a reading selection;
- determine the purpose of a classification organizational pattern in a reading selection;
- identify transition words/phrases in grouping or categorizing people or things according to an established criteria in a reading selection;
- determine the purpose of a problem-solution organizational pattern in a reading selection;
- identify transition words/phrases in recognizing a problem and solution pattern in a reading selection;
- determine the purpose of summarization organizational pattern in a reading selection;

- identify transition words/phrases in condensing information to its principle parts in a reading selection.

CRITICAL REASONING:
The student will demonstrate the ability to:

- recognize stated or implied assumptions in evaluating the validity of an author's argument in a reading selection;
- evaluate the relevance of details, illustrations, and graphic data to an author's argument in a reading selection;
- judge the strength of a writer's argument in a reading selection;
- recognize and evaluate the validity of analogies in a reading selection;
- differentiate between fact and opinion in a reading selection;
- determine the objectivity and credibility of a writer or source in a reading selection;
- draw a logical conclusion based on stated or implied information within a reading selection.

STUDY SKILLS:
The student will demonstrate the ability to:

- organize lecture notes, textbook information, and supplementary material for study purposes;
- apply specific test-taking strategies in a testing environment;
- follow written instructions in technical, scientific, and general academic material;
- interpret information that is presented in charts, graphs, or tables;
- apply rules, methods, concepts, principles, laws, or theories from a reading selection to a new situation.

READING RATE:
The student will demonstrate the ability to:

- increase reading speed while comprehending what is read.

LECTURE OUTLINE (CONTENT)

Lecture Topics	Text Reference Page	Contact Hrs.
Course Introduction		2
Study Skills		2
Vocabulary		2
Topic, Main Idea, Supporting Details, Summarizing, and Outlining		2
Patterns of Organization		2
Skills Review		2
Drawing Conclusions, Predicting Outcomes, and Making Inferences		2
Author's Intent, Argumentation, and Propaganda		2
Figurative Language and Graphic Aids		2
Skills Review		2
Course Wrap-Up		4
	Total Lecture Hours	**24**

LABORATORY OUTLINE (CONTENT)

The laboratory component supplements lecture by providing additional skills development related to the course objectives. Eight (8) weekly lab application activities are assigned for homework.

Total Lab Hours 36

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. COMPETENCIES

- *A.* ***Resources:*** *Identifies, organizes, plans, and allocates resources*
    - 1. follows a schedule to complete assigned tasks on time
    - 2. prepares individual time-plan
    - 3. provides a self-evaluation of performance based on the time and quality of work
    - 4. identifies individual strengths and weaknesses through self-reflection
- *B.* ***Interpersonal:*** *Works with others*
    - 1. participates in group discussions and projects. Works cooperatively with others and contributes to the group process with ideas and suggestions
    - 2. provides feedback to peers and instructors
    - 3. works with diversity through interaction of class members of varied ethnic, gender, religious, and social backgrounds
- *C.* ***Information:*** *Acquires and uses information*
    - 1. completes assignments in textbook and evaluates individual performance
    - 2. judges the validity of reading assignments
    - 3. maintains a folder with class notes and related handouts
    - 4. draws conclusions and makes inferences from reading assignments and verbally communicates to classmates
    - 5. selects appropriate software and uses computers to complete tutorial assignments

II. FOUNDATION SKILLS

- *A.* ***Basic Skills:*** *Reads, writes, performs arithmetic and mathematical operations, listens, and speaks.*
    - *1.* ***Reading:*** *Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*

a. reads and studies textbook and reading assignments
b. interprets reading assignments
c. locates and interprets written information including graphs, charts and periodical articles
d. interprets class schedule

2. *Writing: Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
   a. completes written assignments
   b. takes class notes
   c. applies reading skills in a writing situation
3. *Listening: Receives, attends to, interprets, and responds to verbal messages and other cues*
   a. receives/interprets lecture material
   b. responds to verbal messages
   c. confirms verbal message interpretations with instructor and peers, both in and out of class
   d. makes appropriate behavior responses to verbal messages
   e. participates in discussion and identification of the difference between listening and hearing
4. *Speaking: Organizes ideas and communicates orally*
   a. participates in classroom discussions
   b. organizes ideas and communicates specific questions to the instructor
   c. verbally affirms understanding of a concept, procedure, or required skill

B. *Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*

1. *Creative Thinking: Generates new ideas*
   a. develops new ideas for approaching problem solving
   b. participates in the "brain-storming" process
   c. participates in group problem solving process
   d. practices the team approach to problem solving
2. *Decision Making: Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
   a. identifies personal goals
   b. identifies actions required to accomplish personal goals
3. *Problem Solving: Recognizes problems and devises and implements plan of action*
   a. makes daily accommodations to stay on schedule
   b. seeks additional instruction/clarification for assignment completion
   c. balances social and academic life/responsibilities
   d. accepts responsibility
4. *Seeing Things In the Mind's Eye: Organizes and processes symbols, pictures, graphs, objects, and other information*
   a. interprets graphical data
   b. interprets non-verbal communication in the classroom

5. ***Knowing How to Learn:** Uses efficient learning techniques to acquire and apply new knowledge and skills*
    a. completes and interprets learning style inventory
    b. utilizes techniques for creative thinking
    c. develops strategies for effective problem solving approaches
6. ***Reasoning:** Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
    a. performs self-analysis of effective learning style
    b. selects appropriate communication form (oral vs. written)

C. ***Personal Qualities:** Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*

1. ***Responsibility:** Exerts a high level of effort and perseveres towards goal attainment*
    a. develops stress management techniques that facilitate and encourage achievement of academic and personal goals
    b. accepts responsibility for effective written and oral communication
2. ***Self-Esteem:** Believes in own self-worth and maintains a positive view of self*
    a. develops interpersonal skills permitting a positive projection of self
    b. participates in classroom discussions about self-esteem
3. ***Sociability:** Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
    a. develops effective communication across cultures
    b. interacts with peers, listens effectively, and provides constructive criticism
    c. learns to distinguish between sympathy and empathy
4. ***Self-Management:** Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
    a. monitors/assesses personal goal progress
5. ***Integrity/Honesty:** Chooses ethical courses of action*
    a. meets specific criteria standards to successfully complete the course
    b. encouraged to accept ethical and honest courses of action set by example
    c. provide situations and group activities for students to explore and formulate professional and personal ethical standards

*M*achine Tool *A*dvanced *S*kills
*T*echnology Program

MAST

COURSE SYLLABUS

COLLEGE PREPARATORY READING II
(REMEDIATION)

MAST PROGRAM
COURSE SYLLABUS
COLLEGE PREPARATORY READING II

Lecture hours/week: 2 **Lab hours/week: 3** **Credit hours: 3**

COURSE DESCRIPTION:

An intermediate course designed to prepare students to meet entry-level requirements for certificate and associate degree programs. Course objectives emphasize skill development and/or refinement in literal, interpretive, and evaluative comprehension; vocabulary; reading rate; and application of study skills to reading assignments. Independent lab study reinforces the lecture component.

PREREQUISITES: **Entry is by placement and/or diagnostic testing instruments, completion of College Preparatory Reading I, or by referral of the counseling staff.**

REQUIRED COURSE MATERIALS:

Recommended Textbook: Ten Steps to Advancing College Reading Skills, Langan, John and Broderick, Bill, 2nd ed., New Jersey: Townsend Press, 1993

Supplies:
Standard lined notebook paper
#2 pencils
one package of scantrons

COURSE OBJECTIVES:

VOCABULARY:
The student will demonstrate the ability to:
- use context clues to determine the meaning of a word with multiple meanings;
- use context clues within a paragraph or longer unit of writing to determine the meaning of an unfamiliar word;
- use the context within a paragraph or longer unit of writing to determine the meaning of a figurative expression.

COMPREHENSION:
The student will demonstrate the ability to:
- identify the topic of a paragraph or longer unit of writing;
- identify the stated main idea of a paragraph or longer unit of writing;
- identify a summary of the unstated main idea within a paragraph or longer unit of writing;

- recognize ideas that support, exemplify, or expound the main idea in a paragraph or longer unit of writing.

AUTHOR'S INTENT:

The student will demonstrate the ability to:

- recognize an author's purpose for writing;
- evaluate the relevance of written material for a specific purpose or audience;
- evaluate the content, word choice, and phrasing in a reading selection to determine the opinions and attitudes of an author;
- identify a summary of the intended meaning of a section of material in a reading selection;
- recognize the intended emotional effect that an author's choice or use of words has on the reader.

ORGANIZATION OF IDEAS:

The student will demonstrate the ability to:

- determine the purpose of a definition and example organizational pattern in a reading selection;
- identify transition words/phrases in defining or explaining a specialized term, phrase, or idea in a reading selection;
- determine the purpose of a time order organizational pattern in a reading selection;
- identify transition words/phrases in determining time order in a reading selection;
- identify the sequence of steps in technical, scientific, and research-related material;
- determine the purpose of spatial order organizational pattern in a reading selection;
- identify transition words/phrases in determining spatial order in a reading selection;
- determine the purpose of an order of importance organizational pattern in a reading selection;
- identify transition words/phrases in determining order of importance in a reading selection;
- determine the purpose of a comparison organizational pattern in a reading selection;
- identify transition words/phrases in determining the similarities in two or more ideas, events, or things in a reading selection;
- determine the purpose of a contrast organizational pattern in a reading selection;
- identify transition words/phrases in analyzing relationships between ideas in opposition in a reading selection;
- determine the purpose of a simple listing organizational pattern in a reading selection;
- identify transition words/phrases in determining a simple listing pattern in a reading selection;
- determine the purpose of a cause-effect organizational pattern in a reading selection;
- identify transition words/phrases in determining a cause-effect relationship in a reading selection;
- determine the purpose of a classification organizational pattern in a reading selection;
- identify transition words/phrases in grouping or categorizing people or things according to an established criteria in a reading selection;
- determine the purpose of a problem-solution organizational pattern in a reading selection;
- identify transition words/phrases in recognizing a problem and solution pattern in a reading selection;
- determine the purpose of a summarization organizational pattern in a reading selection;
- identify transition words/phrases in condensing information to its principle parts in a reading selection.

CRITICAL REASONING:

The student will demonstrate the ability to:

- recognize stated or implied assumptions in evaluating the validity of an author's argument in a reading selection;
- evaluate the relevance of details, illustrations, and graphic data to an author's argument in a reading selection;
- judge the strength of a writer's argument in a reading selection;
- recognize and evaluate the validity of analogies in a reading selection;
- differentiate between fact and opinion in a reading selection;
- determine the objectivity and credibility of a writer or source in a reading selection;
- draw a logical conclusion based on stated or implied information within a reading selection.

STUDY SKILLS:

The student will demonstrate the ability to:

- organize lecture notes, textbook information, and supplementary material for study purposes;
- apply specific test-taking strategies in a testing environment;
- follow written instructions in technical, scientific, and general academic material;
- interpret information that is presented in charts, graphs, or tables;
- apply rules, methods, concepts, principles, laws, or theories from a reading selection to a new situation.

READING RATE:

The student will demonstrate the ability to:

- increase reading speed while comprehending what is read.

LECTURE OUTLINE (CONTENT)

Lecture Topic	Text Reference Page	Contact Hrs.
Course Introduction		2
Study Skills		2
Vocabulary		2
Topic, Main Idea, Supporting Details, Summarizing, and Outlining		2
Patterns of Organization		2
Skills Review		2
Drawing Conclusions, Predicting Outcomes, and Making Inferences		2
Author's Intent, Argumentation, and Propaganda		2
Figurative Language and Graphic Aids		2
Skills Review		2
Course Wrap-Up		4
	Total Lecture Hours	**24**

LAB OUTLINE (CONTENT)

The laboratory component supplements lecture by providing additional skills development related to the course objectives. Eight (8) weekly lab application activities are assigned for homework.

Total Lab Hours 36

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. **COMPETENCIES**
  A. ***Resources:** Identifies, organizes, plans, and allocates resources*
    1. follows a schedule to complete assigned tasks on time
    2. prepares individual time-plan
    3. provides a self-evaluation of performance based on the time and quality of work
    4. identifies individual strengths and weaknesses through self-reflection
  B. ***Interpersonal:** Works with others*
    1. participates in group discussions and projects; works cooperatively with others and contributes to the group process with ideas and suggestions
    2. provides feedback to peers and instructors
    3. works with diversity through interaction of class members of varied ethnic, gender, religious, and social backgrounds
  C. ***Information:** Acquires and uses information*
    1. completes assignments in textbook and evaluates individual performance
    2. judges the validity of reading assignments
    3. maintains a folder with class notes and related handouts
    4. draws conclusions and makes inferences from reading assignments and verbally communicates to classmates
    5. selects appropriate software and uses computers to complete tutorial assignments

II. **FOUNDATION SKILLS**
  A. ***Basic Skills:** Reads, writes, performs arithmetic and mathematical operations, listens, and speaks.*
    1. ***Reading:** Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
      a. reads and studies textbook and reading assignments

    b. interprets reading assignments
    c. locates and interprets written information including graphs, charts and periodical articles
    d. interprets class schedule
2. ***Writing:*** *Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
    a. completes written assignments
    b. takes class notes
    c. applies reading skills in a writing situation
3. ***Listening:*** *Receives, attends to, interprets, and responds to verbal messages and other cues*
    a. receives/interprets lecture material
    b. responds to verbal messages
    c. confirms verbal message interpretations with instructor and peers, both in and out of class
    d. makes appropriate behavior responses to verbal messages
    e. participates in discussion and identification of the difference between listening and hearing
4. ***Speaking**: Organizes ideas and communicates orally*
    a. participates in classroom discussions
    b. organizes ideas and communicates specific questions to the instructor
    c. verbally affirms understanding of a concept, procedure, or required skill

B. ***Thinking Skills:*** *Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*

1. ***Creative Thinking**: Generates new ideas*
    a. develops new ideas for approaching problem solving
    b. participates in the "brain-storming" process
    c. participates in group problem solving process
    d. practices the team approach to problem solving
2. ***Decision Making**: Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
    a. identifies personal goals
    b. identifies actions required to accomplish personal goals
3. ***Problem Solving**: Recognizes problems and devises and implements plan of action*
    a. makes daily accommodations to stay on schedule
    b. seeks additional instruction/clarification for assignment completion
    c. balances social and academic life/responsibilities
    d. accepts responsibility
4. ***Seeing Things In the Mind's Eye**: Organizes and processes symbols, pictures, graphs, objects, and other information*
    a. interprets graphical data
    b. interprets non-verbal communication in the classroom
5. ***Knowing How to Learn:*** *Uses efficient learning techniques to acquire and apply new knowledge and skills*

        a. completes and interprets learning style inventory
        b. utilizes techniques for creative thinking
        c. develops strategies for effective problem solving approaches
    6. ***Reasoning**: Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
        a. performs self-analysis of effective learning style
        b. selects appropriate communication form (oral vs. written)

C. ***Personal Qualities:** Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*
    1. ***Responsibility**: Exerts a high level of effort and perseveres towards goal attainment*
        a. develops stress management techniques that facilitate and encourage achievement of academic and personal goals
        b. accepts responsibility for effective written and oral communication
    2. ***Self-Esteem**: Believes in own self-worth and maintains a positive view of self*
        a. develops interpersonal skills permitting a positive projection of self
        b. participates in classroom discussions about self-esteem
    3. ***Sociability**: Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
        a. develops effective communication across cultures
        b. interacts with peers and listens effectively and provides constructive criticism
        c. learns to distinguish between sympathy and empathy
    4. ***Self-Management**: Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
        a. monitors/assesses personal goal progress
    5. ***Integrity/Honesty**: Chooses ethical courses of action*
        a. meets specific criteria standards to successfully complete the course
        b. encouraged to accept ethical and honest courses of action set by example
        c. provide situations and group activities for students to explore and formulate professional and personal ethical standards

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MAST

COURSE SYLLABUS

WRITING SKILLS I
(REMEDIATION)

MAST PROGRAM
COURSE SYLLABUS
WRITING SKILLS I

Lecture hours/week: 1 **Lab hours/week: 3** **Credit hours: 2**

COURSE DESCRIPTION:

An introductory course designed to assist students in essential written communication skills. It includes studies in the sentence and its parts, punctuation, capitalization, the parts of speech, spelling, and language usage.

PREREQUISITES: **English placement test**

REQUIRED COURSE MATERIALS:

Recommended Textbooks:

Sentence Combining, Strong, William; Utah State University: McGraw-Hill Inc., 4th Ed., 1994

Basic English Review, Schacter, Norman and Clark, Alfred T.; Cincinnati, Ohio: South-Western Publishing Co., 4th Ed., 1993

Supplies:

Notebook paper
Pens (2)
Liquid paper
Dictionary

COURSE OBJECTIVES:

Upon completion of this course, the student will:

1. Locate subjects and verbs in given sentences;
2. Write sentences using subjects and verbs correctly;
3. Define and use the eight parts of speech in sentences;
4. Use the appropriate punctuation marks correctly in sentences;
5. Capitalize words correctly in given sentences;
6. Write sentences using a variety of clauses and phrases;
7. Use conjunctions to join and combine sentences;
8. Revise sentences containing fragments, run-ons, and comma splices.

Lecture:

The lecture consists of instructor explanation of the grammar, mechanics, and sentence combining techniques that compose the material that is covered for the week.

Laboratory:

Lab is designed to supplement and reinforce the material that has been presented during weekly lectures. During the lab time, students, under the guidance of the instructor, work exercises in the workbook. These exercises are corrected during the lab period. Any student who has had difficulty with any exercises has the opportunity to clarify material. Also, the lab periods give the instructor the opportunity to supervise the student's work individually and to offer immediate assistance. In addition, the instructor can request that the student see him/her privately if the instructor perceives that a particular student is having great difficulty with the material.

LECTURE OUTLINE

Lecture Topics	Text Reference Page	Contact Hrs.
Orientation/Initial Writing Assignment	Book: Basic English Review	
Nouns	Unit 2	
Pronouns	Unit 3	
Verbs	Unit 4 and 5	
TEST		
Adjectives and Adverbs	Unit 6	
TEST		
Prepositions	Unit 7	
Interjections	Unit 1	
TEST		
Conjunctions	Unit 7	
TEST		
Kinds of Sentences	Unit 1	
Phrases and Clauses	Unit 8	
Sentence Classification	Unit 11	
TEST		
Punctuation and Capitalization	Unit 9	
TEST		
Sentence Combining Techniques	Book: Sentence Combining, A Composing Book	
Instructor will assign the clusters	Units 1, 2 and 3	
TEST (WEEKLY)		
REVIEW		
FINAL EXAM		
STUDENT CONFERENCE		
	Total Lecture Hours	12

LAB OUTLINE

Lab Topics		Contact Hrs.
Initial Writing Assignment	Book: Basic English Review	
Nouns	Unit 2	
Pronouns	Unit 3	
Verbs	Unit 4 and 5	

Adjectives and Adverbs	Unit 6	
Prepositions	Unit 7	
Interjections	Unit 1	
Conjunctions	Unit 7	
Kinds of Sentences	Unit 1	
Phrases and Clauses	Unit 8	
Sentence Classification	Unit 11	
Punctuation and Capitalization	Unit 9	
Sentence Combining Techniques	Book: Sentence Combining, A Composing Book	
Instructor will assign the clusters	Units 1, 2 and 3	
	Total Lab Hours	**36**

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. COMPETENCIES

- A. ***Resources:** Identifies, organizes, plans, and allocates resources*
    1. follows a schedule to complete assigned tasks on time
    2. students select and use appropriate video and computer software tutorials
    3. provides a self-evaluation of performance based on the time and quality of work
    4. maintain a record of grades and assesses academic progress and makes necessary adjustments
- B. ***Interpersonal:** Works with others*
    1. participates as a member of a team through class discussions and group projects; works cooperatively with others and contributes to the group process with ideas and suggestions; students are assigned to a group to share ideas
    2. provides feedback to peers and instructors
    3. works with diversity through interaction with class members of varied ethnic, religious, gender and social backgrounds
- C. ***Information:** Acquires and uses information*
    1. maintains individual student progress records and assesses academic progress
    2. organizes and maintains class handouts and homework assignments in a individual student folder

3. students participate in assessment and knowledge of writing skills providing feedback to the instructor and classmates
4. uses appropriate computer tutorial software applications

D. *Systems: Understands complex inter-relationships*
1. understands the system involved in the writing process
2. monitors and corrects performance during the writing process

E. *Technology: Works with a variety of technologies*
1. selects and uses appropriate software applications in the writing lab
2. understands proper procedures for set-up of computer and its software to meet individual writing needs

II. FOUNDATION SKILLS:

A. ***Basic Skills:*** *Reads, writes, performs arithmetic and mathematical operations, listens, and speaks.*

1. ***Reading:*** *Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
- a. reads and studies textbook and workbook
- b. interprets reading assignments
- c. interprets class schedule
- d. identifies and locates the eight different parts of speech

2. ***Writing:*** *Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
- a. completes written assignments
- b. takes class notes
- c. composes sentences using the appropriate parts of speech and mechanics

3. ***Arithmetic/Mathematics:*** *Performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques.*
- a. computes individual class average

4. ***Listening:*** *Receives, attends to, interprets, and responds to verbal messages and other cues*
- a. receives/interprets lecture material
- b. responds to verbal messages
- c. confirms verbal message interpretations with instructor and peers, both in and out of class
- d. makes appropriate behavior responses to verbal messages
- e. participates in discussion and identification of the difference between listening and hearing

5. ***Speaking:*** *Organizes ideas and communicates orally*
- a. participates in classroom discussions
- b. organizes ideas and communicates specific questions to the instructor
- c. verbally affirms understanding of a concept, procedure, or required skill
- d. communicates with peers to ensure the smooth and safe operation of the laboratory

B. ***Thinking Skills:*** *Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*

- 1. ***Creative Thinking**: Generates new ideas*
    - a. develops new ideas for approaching problem solving
    - b. participates in group problem solving process
    - c. practices the team approach to problem solving
- 2. ***Decision Making:** Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
    - a. identifies personal goals
    - b. identifies actions required to accomplish personal goals
- 3. ***Problem Solving**: Recognizes problems and devises and implements plan of action*
    - a. makes daily accommodations to stay on schedule
    - b. seeks additional instruction/clarification for assignment completion
    - c. accepts responsibility
- 4. ***Seeing Things In the Mind's Eye:** Organizes and processes symbols, pictures, graphs, objects, and other information*
    - a. interprets non-verbal communication in the classroom
- 5. ***Knowing How to Learn:** Uses efficient learning techniques to acquire and apply new knowledge and skills*
    - a. develops techniques for adapting learning style for differences in teaching style
    - b. utilizes techniques for creative thinking
    - c. develops strategies for effective problem solving approaches
- 6. ***Reasoning:** Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
    - a. performs self-analysis of effective learning styles for specific situations
    - b. selects appropriate communication form
    - c. identifies and utilizes the rule of English writing

C. ***Personal Qualities:*** *Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*

- 1. ***Responsibility:** Exerts a high level of effort and perseveres towards goal attainment*
    - a. develops stress management techniques that facilitate and encourage achievement of academic and personal goals
    - b. accepts responsibility for effective written and oral communication
- 2. ***Self-Esteem:** Believes in own self-worth and maintains a positive view of self*
    - a. develops interpersonal skills permitting a positive projection of self through positive reinforcement on daily basis
- 3. ***Sociability:** Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
    - a. develops effective communication across cultures
    - b. interacts with peers and listens effectively and provides constructive criticism
    - c. learns to distinguish between sympathy and empathy

4. *Self-Management: Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
   a. monitors/assesses personal goal progress
   b. provided with goals of the course and is expected to apply the mechanic of writing and sentence combining techniques
5. *Integrity/Honesty: Chooses ethical courses of action*
   a. meets specific criteria standards to successfully complete the course
   b. encouraged to accept ethical and honest courses of action set by example

ENGL010
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MAST

COURSE SYLLABUS

WRITING SKILLS II
(REMEDIATION)

MAST PROGRAM
COURSE SYLLABUS
WRITING SKILLS II

Lecture hours/week: 2 **Lab hours/week: 2** **Credit hours: 3**

COURSE DESCRIPTION:

Review of basic sentence grammar and mechanical skills, with an emphasis on writing, editing, and revising paragraphs. Introduction to the multi paragraph essay.

PREREQUISITES: **English placement test**

RECOMMENDED COURSE MATERIALS:

Recommended Textbook:	A Guide to Writing, Fawcett, S. And Sandberg, A., Houghton Mifflin, 5th ed., 1995
Supplies:	Spiral Notebook with perforated tear sheets Ballpoint pens with black or blue ink Liquid paper Comprehensive, paperback, college dictionary Scantron sheets, 2 packages

COURSE OBJECTIVES:

Upon completion of this course, the student will:

1. use appropriate pre-writing techniques to narrow subjects, generate topic ideas, and produce focused topic sentences and thesis statements;
2. write unified and well-developed paragraphs with specific topic sentences by following appropriate organizational plans;
3. plan and write a short well-organized essay, containing a specific thesis statement, an effective introduction, a well-developed body, and an appropriate conclusion;
4. revise paragraphs and essays for coherence, organization, sentence variety, language usage, consistence, and parallel structure;
5. edit paragraphs and essays for grammar, punctuation, and spelling.

LECTURE OUTLINE:

Lecture Topics	Text Reference Page	Contact Hrs.
Orientation to course		1
Agreement		2
A. The simple sentence		
B. Subject-verb agreement		

  - C. Pronoun-antecedent agreement
- The sentence 2
  - A. Coordination/subordination
  - B. Fragments
  - C. Comma splices and run-ons
- Punctuation and mechanics 2
  - A. The apostrophe
  - B. The comma
  - C. The colon
  - D. Capitalization
  - E. Titles
  - F. Quotations
- Consistency and parallelism 3
  - A. Tense
  - B. Person
  - C. Number
  - D. Discourse
  - E. Parallel structure
- Sentence variety in paragraph writing 2
  - A. Mixing long and short sentences
  - B. Mixing types of sentences
  - C. Varying beginnings of sentences
  - D. Joining ideas
- Paragraph development and unity 3
  - A. Generating ideas
  - B. Narrowing the topic
  - C. Writing the topic
  - D. Developing ideas for the body
  - E. Arranging ideas in a plan
- Paragraph organization and coherence 3
  - A. Coherence through order
    - 1. Time order
    - 2. Space order
    - 3. Order of climax
  - B. Coherence through transitional devices
    - 1. Repeating words and pronouns
    - 2. Using synonyms and substitutions
    - 3. Using transitional expressions
- Language usage in paragraph writing 3
  - A. Using exact language
  - B. Using concise language
  - C. Using original language
  - D. Using figurative language
- The Essay 3
  - A. Structure
  - B. The thesis statement
  - C. Planning the body
  - D. Ordering and linking body paragraphs

E. Writing the first draft
F. Revising the first draft
G. Editing the first draft
H. Writing the final draft

Total Lecture Hours	24

LAB OUTLINE:

Lab Topics	Contact Hrs.
Agreement practice	2
The sentence practice	2
Punctuation and mechanics practice	2
Consistency and parallelism practice	3
Sentence variety in paragraph writing practice	2
Paragraph development and unity practice	3
Paragraph organization and coherence practice	3
Language usage in paragraph writing practice	3
The Essay practice	3
Final Exam	1
Total Lab Hours	24

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. COMPETENCIES

- *A. Resources: Identifies, organizes, plans, and allocates resources*
  1. follows a schedule to complete assigned tasks on time
  2. provides a self-evaluation of performance based on the time and quality of work
  3. maintains a record of individual academic performance, evaluating academic progress and adjusts accordingly
- *B. Interpersonal: Works with others*
  1. participates as a member of a team through class discussions and group projects; works cooperatively with others and contributes to the group process with ideas and suggestions
  2. provides peer evaluation and feedback on writing assignments

    3. works with diversity through interaction with class members of varied ethnic, religious, gender, and social backgrounds

C. *Information: Acquires and uses information*
    1. applies appropriate skills and techniques of writing to develop, evaluate, and revise individual compositions
    2. develops organized plan for writing paragraphs and essays
    3. applies learned writing skills and process to communicate information in an organized manner

D. *Systems: Understands complex inter-relationships*
    1. understands the system involved in the writing process
    2. monitors and corrects performance during the writing process

E. *Technology: Works with a variety of technologies*
    1. selects appropriate software applications in the writing lab
    2. applies appropriate software applications in the writing laboratory

II. **FOUNDATION SKILLS**

A. *Basic Skills: Reads, writes, performs arithmetic and mathematical operations, listens, and speaks.*
    1. *Reading: Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
        a. reads and studies textbook, workbook, and reading assignments
        b. interprets reading assignments
        c. locates and interprets written information
        d. interprets class schedule
    2. *Writing: Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
        a. completes written assignments including paragraphs, sentence combining, and essay
        b. takes class notes
    3. *Arithmetic/Mathematics: Performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques*
        a. computes individual grade through the maintenance of a student grade record
    4. *Listening: Receives, attends to, interprets, and responds to verbal messages and other cues*
        a. receives/interprets lecture material
        b. responds to verbal messages
        c. confirms verbal message interpretations with instructor and peers, both in and out of class
        d. makes appropriate behavior responses to verbal messages
    5. *Speaking: Organizes ideas and communicates orally*
        a. participates in classroom discussions
        b. organizes ideas and communicates specific questions to the instructor
        c. verbally affirms understanding of a concept, procedure, or required skill

B. *Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*

1. ***Creative Thinking**: Generates new ideas*
   - a. develops new ideas for approaching problem solving
   - b.. participates in group problem solving process
2. ***Decision Making:** Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
   - a. selects alternative paragraph and essay topics
   - b. identifies actions required to accomplish personal goals
3. ***Problem Solving:** Recognizes problems and devises and implements plan of action*
   - a. makes daily accommodations to stay on schedule
   - b. seeks additional instruction/clarification for assignment completion
   - c. accepts responsibility
4. ***Seeing Things In the Mind's Eye:** Organizes and processes symbols, pictures, graphs, objects, and other information*
   - a. students are provided with a graphical analogy for paragraph and essay structure to assist in the visualization and application of writing skill development
   - b. interprets non-verbal communication in the classroom
5. ***Knowing How to Learn:** Uses efficient learning techniques to acquire and apply new knowledge and skills*
   - a. develops techniques for adapting learning style for differences in teaching style
   - b. utilizes techniques for creative thinking
   - c. applies learned writing skills to generate ideas for paragraph and essay construction
6. ***Reasoning:** Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
   - a. applies the rules and principles of basic grammar and mechanics to construct and edit sentences

C. *Personal Qualities: Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*

1. ***Responsibility:** Exerts a high level of effort and perseveres towards goal attainment*
   - a. develops stress management techniques that facilitate and encourage achievement of academic and personal goals
   - b. accepts responsibility for effective written and oral communication
2. ***Self-Esteem:** Believes in own self-worth and maintains a positive view of self*
   - a. develops interpersonal skills permitting a positive projection of self through daily positive feedback from the instructor
3. ***Sociability:** Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
   - a. develops effective communication across cultures
   - b. Interacts with peers and listens effectively and provides constructive criticism

4. ***Self-Management:** Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
    a. Monitors/assesses personal goal progress
5. ***Integrity/Honesty:** Chooses ethical courses of action*
    a. meets specific criteria standards to successfully complete the course
    b. encouraged to accept ethical and honest courses of action set by example
    c. provide situations and group activities for students to explore and formulate professional and personal ethical standards

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MAST

COURSE SYLLABUS

BASIC MATHEMATICS
(REMEDIATION)

MAST PROGRAM
COURSE SYLLABUS
BASIC MATHEMATICS

Lecture hours/week: 2 **Lab hours/week: 3** **Credit hours: 3**

COURSE DESCRIPTION:

The purpose of this course is to provide a review of the fundamentals of mathematics by stressing practical applications. It includes the concepts of whole numbers, fractions, decimals, measurement and geometry, operations with signed numbers, and solutions of simple linear equations.

PREREQUISITES: **Placement by Computer Placement Test (CPT)**

REQUIRED COURSE MATERIALS:

Recommended Textbook:	Basic College Math: An Applied Approach, Aufman/Barker, 4th ed., Houghton Mifflin Publishing Co.
Supplies:	3-ring notebook notebook paper pencils Scantron form 882 w/100 answers

COURSE OBJECTIVES:

This course will include practical applications of each topic in reviewing the concepts of Basic Mathematics. Upon completion of the course the student should be able to:

1. Solve various types of practical problems requiring subtraction, multiplication, and division of whole numbers. Order of operations will be included;
2. Solve practical problems requiring addition, subtraction, multiplication, and division of two or more common fractions or mixed numbers;
3. Add, subtract, multiply, and divide decimal numbers and express the answer of all practical applications to the required decimal place. Conversions between decimal numbers, fractions, and percents will be included;
4. Apply addition, subtraction, multiplication, division, and conversions of units of measurement within the English system and express the answers to all practical applications in simplest form;
5. Convert units of measurement within the metric system and solve practical applications requiring addition, subtraction, multiplication, and division of metric units. Conversions between the metric system and the English system will be included;

6. Determine the perimeter, area, or volume of a standard geometric figure and express the answer to a practical problem in the required units of measurement. The basic concepts of angles, lines, and geometric figures will be covered;
7. Add, subtract, multiply, and divide signed numbers. This includes order of operations and evaluating expressions;
8. Solve simple linear equations. Translating sentences into equations and solving will be included.

LECTURE OUTLINE:

Lecture Topic	Text Reference Page	Contact Hrs.
Course Introduction		1
Whole Numbers		2
a. Addition		
b. Subtraction		
c. Multiplication		
d. Division		
e. Order of Operation		
Fractions and Mixed Numbers		4
a. Reducing Fractions		
b. Changing to Equivalent Fractions		
c. Greatest Common Denominator		
d. Least Common Denominator		
e. Addition		
f. Subtraction		
g. Multiplication		
h. Division		
i. Applied Problems		
Decimal Numbers		4
a. Reading and Writing Decimal Numbers		
b. Rounding off Decimal Numbers to a Given Place Value		
c. Converting Numbers between Decimal, Fraction, Percent		
d. Addition		
e. Multiplication		
f. Division		
g. Applied Problems		
Measurement		2
a. Converting Units of Distance, Weight, and Capacity within the English (U.S. Customary) System		
b. Converting Units of Distance, Weight, and Capacity within		

the Metric System	
c. Converting Units of Distance, Weight, and Capacity between the English System and the Metric System	
d. Addition, Subtraction, Multiplication, and Division of English and Metric Units	
e. Applied Problems	
Geometry	3
a. Angles, Lines, and Geometric Figures	
b. Perimeters of Standard and Composite Geometric Figures	
c. Areas of Standard and Composite Geometric Figures	
d. Volumes of Standard and Geometric Solids	
Rational Numbers	4
a. Introduction to Integers	
b. Addition and Subtraction of Integers	
c. Multiplication and Division of Integers	
d. Operations with Rational Numbers	
e. Order of Operations	
Introduction to Algebra	4
a. Variable Expressions	
b. Introduction to Equations	
c. Solving One-Step Linear Equations	
d. Solving Multi-Step Linear Equations	
e. Translating Verbal Expression into Mathematical Expressions	
f. Translating Sentences into Equations and Solving	
Total Lecture Hours	**24**

LAB OUTLINE

Lab Topics	Contact Hrs.
Three hours per week in the classroom will be considered laboratory activity. The student will utilize this time working on current assignments with the assistance of the instructor.	
Whole Numbers Practice	4
Fractions and Mixed Numbers Practice	5
Decimal Numbers Practice	5

Measurement Practice	5
Geometry Practice	5
Rational Numbers Practice	5
Introduction to Algebra Practice	5
Final Exam	2
Total Lab Hours	**36**

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. **COMPETENCIES**
   - *A.* ***Resources:*** *Identifies, organizes, plans, and allocates resources*
     1. follows a schedule to complete assigned tasks on time
     2. provide a self-evaluation of performance based on the time and quality of work
   - *B.* ***Interpersonal:*** *Works with others*
     1. participates in classroom dialogue, contributing to group effort in problem solving
     2. works well with all members of the class
   - *C.* ***Information:*** *Acquires and uses information*
     1. apply mathematical solutions to problems assigned
     2. organize and maintain lecture notebook and assignment notebook
     3. communicates/interprets information by participating in classroom dialogue
     4. uses 050 computer tutorials as necessary
   - *D.* ***Systems:*** *Understands complex inter-relationships*
     1. applies a systematic approach to solving mathematical problems
     2. develops an understanding of mathematical system complexity with applications to algebra, geometry, and trigonometric equation solving
   - *E.* ***Technology:*** *Works with a variety of technologies*
     1. selects appropriate calculator to meet the needs of the course
     2. selects appropriate methods to solve mathematical problems
     3. selects appropriate measurement procedures
     4. applies mathematical problem solving skills using a scientific calculator

II. **FOUNDATION SKILLS**
   - *A.* ***Basic Skills:*** Reads, writes, performs arithmetic and mathematical operations, listens and speaks.

1. *Reading: Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
    a. interprets word problems, tables, graphs, and drawings to identify presented problem(s)
    b. reads and studies textbook, available tutorials, and video tapes
    c. uses available tutorials in the laboratory as needed
2. *Writing: Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
    a. communicates problem solving skills by solving mathematical problems in writing using presented information
    b. maintains a lecture notebook
    c. completes all written assignments
3. *Arithmetic/Mathematics: Perform basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques*
    a. performs applied computations of arithmetic, algebra, geometry, and trigonometry
    b. performs applied computations of measurement conversions
4. *Listening: Receives, attends to, interprets, and responds to verbal messages and other cues*
    a. assimilate classroom instruction
    b. interpret and assimilate video instruction
    c. observe laboratory demonstrations
    d. seek and receive individualized instruction in the laboratory
    e. participates as an active listener in classroom instruction
5. *Speaking: Organizes ideas and communicates orally*
    a. participates in classroom discussions
    b. organize ideas and communicates specific questions to the instructor
    c. verbally affirms understanding of a concept, procedure, or required mathematical skill
    d. communicates with peers

B. *Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*

1. *Creative Thinking: Generates new ideas*
    a. develops new ideas for approaching problem solving
    b. participates in the "brain-storming" process
    c. participates in group problem solving process
    d. practices the team approach to problem solving
2. *Decision Making: Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
    a. identifies personal goals
    b. selects specific math applications
3. *Problem Solving: Recognizes problems and devises and implements plan of action*
    a. makes daily accommodations to stay on schedule
    b. seeks additional instruction/clarification for assignment completion

        - c. balances social and academic life/responsibilities
        - d. accepts responsibility
    - 4. *Seeing Things In the Mind's Eye: Organizes, and processes symbols, pictures, graphs, objects, and other information*
        - a. prepares sketches, graphs, and tables to assist in understanding word problems
        - b. interprets word problems
        - c. assimilates arithmetic problems in class
        - d. interprets non-verbal communication in the classroom
    - 5. *Knowing How to Learn: Use efficient learning techniques to acquire and apply new knowledge and skills*
        - a. recognizes relevant information to solve specific problem(s)
        - b. identifies "given" data and applies appropriate equations
        - c. demonstrates mastery of basic math skills
        - d. uses sequential math skills to support mastery of new skills
        - e. thinks through the problem mentally before selecting appropriate formula(e)/equation(s)
    - 6. *Reasoning: Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
        - a. understands that the ability to apply mathematics requires "practice"
        - b. understands the necessity to perform math as applied to specific technology
        - c. selects appropriate mathematical application after considering all given data
- C. *Personal Qualities: Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*
    - 1. *Responsibility: Exerts a high level of effort and perseveres towards goal attainment*
        - a. develops an understanding that in order to be successful in mathematics, preparation for the day's work is necessary
        - b. develops an understanding that classroom attendance is essential for success in the course
        - c. accepts the responsibility for active participation in class
    - 2. *Self-Esteem: Believes in own self-worth and maintains a positive view of self*
        - a. learns to take pride in his or her work through positive reinforcement
        - b. sees himself or herself as an asset to the class through continued contributions to the group and a shared common goal
        - c. understands that an individual with a positive attitude and the belief in their own abilities will systematically seek solutions and be a valuable employee
        - d. accepts shared common goals of the class and views each individual as an asset to the group
    - 3. *Sociability: Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
        - a. assist classmates in improving mathematical skills

b. assist students with special needs as a peer mentor
c. share laboratory resources
d. assist classmates in understanding math applications in a group

4. *Self-Management: Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
   a. maintain a record of academic achievement (individual grade book)
   b. accept the responsibility for self-management
   c. set goals and complete assigned tasks
5. *Integrity/Honesty: Chooses ethical courses of action*
   a. accept the responsibility for own actions
   b. exhibit personal honesty at all times
   c. accept the challenge of doing your own work in the laboratory, during examination, and on outside assignments
   d. understand the consequences of unethical behaviors

MATH050
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MAST

COURSE SYLLABUS

BEGINNING ALGEBRA I
(REMEDIATION)

MAST PROGRAM
COURSE SYLLABUS
BEGINNING ALGEBRA I

Lecture hours/week: 2 **Lab hours/week: 3** **Credit hours: 3**

COURSE DESCRIPTION:

The purpose of this course is to give a background in pre-algebra and elementary algebraic concepts. It includes the concepts of signed numbers, evaluating expressions, polynomials, operations with algebraic expressions, and factoring.

PREREQUISITES: **Basic Mathematics or Diagnostic Placement Testing**

REQUIRED COURSE MATERIALS:

Recommended Textbook: Elementary Algebra for College Students, Angel, Allen R., 3rd ed., Prentice Hall Publishing Co., 1988

Supplies:
notebook paper
pencils
Scantron form 882 w/100 answers
1 - 5.25 floppy disk

COURSE OBJECTIVES:

Upon completion of the course the student will:
1. Add, subtract, multiply, and divide signed numbers following the proper order of operations;
2. Apply the laws of exponents;
3. Perform additions, subtractions, multiplications, and divisions with algebraic expressions;
4. Manipulate formulae;
5. Find special products;
6. Factor polynomials.

LECTURE OUTLINE:

Lecture Topics	Text Reference Page	Contact Hrs.
Students enrolled in Beginning Algebra I are scheduled in class for a period of two (2) lecture hours per week and three (3) lab hours per week.		
Operations with Real Numbers		7
a. Order of Operations with		

Whole Numbers
- b. Absolute Value
- c. Addition, Subtraction, Multiplication, and Division of Signed Numbers
- d. Meaning of Exponents
- e. Order of Operations with Real Numbers
- f. Evaluating Expressions and Formulas

Exponents and Algebraic Expression 8
- a. Laws of Exponents
- b. Scientific Notation
- c. Combining "Like" Terms
- d. Addition and Subtraction of Polynomials
- e. Multiplication and Division of Polynomials

Factoring 9
- a. Finding the Greatest Common Factor
- b. Factoring by Grouping
- c. Factoring the Difference of Two Squares
- d. Factoring Trinomials of the Form $ax^2 + bx = c$
- e. Composite Factoring
- f. Factoring the Sum and Difference of Cubes

Total Lecture Hours **24**

LAB OUTLINE:

Lab Topics	**Contact Hrs.**

Students will practice algebraic skills through the use of Algebra Mentor (computer software from Brooks/Cole Publishing Company) or equivalent lab assignments from the text or handouts. Two hours per week in the classroom will be considered laboratory activity. The student will utilize this time working on current assignments with the assistance of the instructor.

Operations with Real Numbers Mentor lessons 0-67 (omit lesson 2)	9
Exponents and Algebraic Expressions Mentor lessons 91-129, 66, 157-163	10
Factoring Mentor lessons 130-156 (omit lesson 140)	12
Testing	5
Total Lab Hours	**36**

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. COMPETENCIES
   - *A.* ***Resources:*** *Identifies, organizes, plans, and allocates resources*
      1. follows a schedule to complete assigned tasks on time
      2. provide a self-evaluation of performance based on the time and quality of work
   - *B.* ***Interpersonal:*** *Works with others*
      1. participates in classroom dialogue, contributing to group effort in problem solving
      2. works well with all members of the class
   - *C.* ***Information:*** *Acquires and uses information*
      1. apply mathematical solutions to problems assigned
      2. organize and maintain lecture notebook and assignment notebook
      3. communicates/interprets information by participating in classroom dialogue
      4. uses 050 computer tutorials as necessary
   - *D.* ***Systems:*** *Understands complex inter-relationships*
      1. applies a systematic approach to solving mathematical problems
      2. develops an understanding of mathematical system complexity with applications to algebra, geometry, and trigonometric equation solving
   - *E.* ***Technology:*** *Works with a variety of technologies*
      1. selects appropriate calculator to meet the needs of the course
      2. selects appropriate methods to solve mathematical problems
      3. selects appropriate measurement procedures
      4. applies mathematical problem solving skills using a scientific calculator

II. FOUNDATION SKILLS
   - *A.* ***Basic Skills:*** *Reads, writes, performs arithmetic and mathematical operations, listens and speaks.*
      - *1.* ***Reading:*** *Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
         - a. interprets word problems, tables, graphs, and drawings to identify presented problem(s)
         - b. reads and studies textbook, available tutorials, and video tapes
         - c. uses available tutorials in the laboratory as needed

2. *Writing: Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
   a. communicates problem solving skills by solving mathematical problems in writing using presented information
   b. maintains a lecture notebook
   c. completes all written assignments
3. *Arithmetic/Mathematics: Perform basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques*
   a. performs applied computations of arithmetic, algebra, geometry, and trigonometry
   b. performs applied computations of measurement conversions
4. *Listening: Receives, attends to, interprets, and responds to verbal messages and other cues*
   a. assimilate classroom instruction
   b. interpret and assimilate video instruction
   c. observe laboratory demonstrations
   d. seek and receive individualized instruction in the laboratory
   e. participates as an active listener in classroom instruction
5. *Speaking: Organizes ideas and communicates orally*
   a. participates in classroom discussions
   b. organizes ideas and communicates specific questions to the instructor
   c. verbally affirms understanding of a concept, procedure, or required mathematical skill
   d. communicates with peers

B. *Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*
   1. *Creative Thinking: Generates new ideas*
      a. develops new ideas for approaching problem solving
      b. participates in the "brain-storming" process
      c. participates in group problem solving process
      d. practices the team approach to problem solving
   2. *Decision Making: Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
      a. identifies personal goals
      b. selects specific math applications
   3. *Problem Solving: Recognizes problems and devises and implements plan of action*
      a. makes daily accommodations to stay on schedule
      b. seeks additional instruction/clarification for assignment completion
      c. balances social and academic life/responsibilities
      d. accepts responsibility
   4. *Seeing Things In the Mind's Eye: Organizes, and processes symbols, pictures, graphs, objects, and other information*

a. prepares sketches, graphs, and tables to assist in understanding word problems
b. interprets word problems
c. assimilates arithmetic problems in class
d. interprets non-verbal communication in the classroom

5. ***Knowing How to Learn:** Use efficient learning techniques to acquire and apply new knowledge and skills*
   a. recognizes relevant information to solve specific problem(s)
   b. identifies "given" data and applies appropriate equations
   c. demonstrates mastery of basic math skills
   d. uses sequential math skills to support mastery of new skills
   e. thinks through the problem mentally before selecting appropriate formula(e)/equation(s)
6. ***Reasoning:** Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
   a. understands that the ability to apply mathematics requires "practice"
   b. understands the necessity to perform math as applied to specific technology
   c. selects appropriate mathematical application after considering all given data

C. ***Personal Qualities:** Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*
1. ***Responsibility:** Exerts a high level of effort and perseveres towards goal attainment*
   a. develops an understanding that in order to be successful in mathematics, preparation for the day's work is necessary
   b. develops an understanding that classroom attendance is essential for success in the course
   c. accepts the responsibility for active participation in class
2. ***Self-Esteem:** Believes in own self-worth and maintains a positive view of self*
   a. learns to take pride in his or her work through positive reinforcement
   b. sees himself or herself as an asset to the class through continued contributions to the group and a shared common goal
   c. understands that an individual with a positive attitude and the belief in their own abilities will systematically seek solutions and be a valuable employee
   d. accepts shared common goals of the class and views each individual as an asset to the group
3. ***Sociability:** Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
   a. assist classmates in improving mathematical skills
   b. assist students with special needs as a peer mentor
   c. share laboratory resources
   d. assist classmates in understanding math applications in a group

4. *Self-Management: Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
    a. maintain a record of academic achievement (individual grade book)
    b. accept the responsibility for self-management
    c. set goals and complete assigned tasks
5. *Integrity/Honesty: Chooses ethical courses of action*
    a. accept the responsibility for own actions
    b. exhibit personal honesty at all times
    c. accept the challenge of doing your own work in the laboratory, during examination, and on outside assignments
    d. understand the consequences of unethical behaviors

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MAST

COURSE SYLLABUS

BEGINNING ALGEBRA II
(REMEDIATION)

MAST PROGRAM
COURSE SYLLABUS
BEGINNING ALGEBRA II

Lecture hours/week: 2 **Lab hours/week: 3** **Credit hours: 3**

COURSE DESCRIPTION:

This course is designed as a continuation of Beginning Algebra I. It begins with rational expressions followed by linear and quadratic equations, formulas and word problems. A basic geometry section will also be included.

PREREQUISITES: **Beginning Algebra I**

REQUIRED COURSE MATERIALS:

Recommended Textbook:	Elementary Algebra for College Students, Angel, Allen R., 3rd ed., Prentice Hall Publishing Co., 1988
Supplies:	notebook paper pencils Scantron form 882 w/100 answers 1 - 5.25 floppy disk

COURSE OBJECTIVES:

Upon completion of the course the student will:

1. Reduce algebraic fractions
2. Multiply and divide algebraic fractions
3. Add and subtract algebraic fractions with a common denominator
4. Find the least common multiple
5. Add and subtract algebraic fractions with unlike denominators
6. Simplify complex algebraic fractions
7. Add and subtract complex algebraic fractions
8. Factor completely and reduce algebraic fractions
9. Solve linear equations using the addition and multiplication properties
10. Solve linear equations with a variable on only one side of the equation
11. Solve linear equations with variables on both sides of the equation
12. Solve linear equations involving fractions
13. Solve formulas for indicated variables
14. Insert the symbols ≤ , ≥ , or = to make a statement true
15. Solve ratios and proportions using cross multiplication
16. Change word problems into equations
17. Solve number and motion problems

18. Solve mixture and geometric problems
19. Find the area of a rectangle
20. Find the volume of a rectangular solid
21. Find the area of a:
    a. Square
    b. Triangle
    c. Circle
    d. Trapezoid
22. Find the volume of a cube and a curve
23. Find the volume, lateral area and total surface area of a cylinder
24. Find the volume of a pyramid and a sphere
25. Find the lateral surface area, total surface area and volume of a prism
26. Find the area of a sphere

LECTURE OUTLINE:

Lecture Topic	Text Reference Page	Contact Hrs.
Rational Expressions		8
a. Reducing Rational Expressions		
b. Multiplication and Division of Rational Expressions		
c. Addition and Subtraction of Rational Expressions		
d. Simplifying Complex Fractions		
e. Solving Rational Expressions		
Solving Linear Equations		10
a. Solving Equations Involving One Operation		
b. Solving Equations Involving More Than One Operation		
c. Solving Equations Involving the Distributive Property		
d. Solving Ratio and Proportion Problems		
e. Solving Equations Containing Rational Expressions		
f. Solving Quadratic Equations by Factoring		
g. Solving for a Variable in a Formula		
h. Translating Word Problems into Equations and Solving		
Geometry		6
a. Area and Volume		
1. Rectangle		
2. Square		
3. Triangle		

    4. Circle
    5. Trapezoid
b. Volume
    1. Rectangle
    2. Cube
    3. Prism
    4. Cone
    5. Sphere
c. Cylinder
    1. Lateral Area
    2. Total Surface Area
    3. Surface Area
    4. Volume

Total Lecture Hours **24**

LAB OUTLINE:

Students will practice algebraic skills through the use of Algebra Mentor (computer software from Brooks/Cole Publishing Company) or equivalent lab assignments from the text or handouts.

Lab Topics	**Contact Hrs.**
Rational Expressions Mentor lessons 157, 164-196	10
Solving Linear Equations Mentor lessons 76-79, 197-204, 207-217	13
Geometric Lab Assignments	8
Testing	5
Total Lab Hours	**36**

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. COMPETENCIES

A. ***Resources:*** *Identifies, organizes, plans, and allocates resources*
    1. follows a schedule to complete assigned tasks on time
    2. provide a self-evaluation of performance based on the time and quality of work
B. ***Interpersonal:*** *Works with others*

1. participates in classroom dialogue, contributing to group effort in problem solving
2. works well with all members of the class

C. *Information: Acquires and uses information*
   1. apply mathematical solutions to problems assigned
   2. organize and maintain lecture notebook and assignment notebook
   3. communicates/interprets information by participating in classroom dialogue
   4. uses 050 computer tutorials as necessary

D. *Systems: Understands complex inter-relationships*
   1. applies a systematic approach to solving mathematical problems
   2. develops an understanding of mathematical system complexity with applications to algebra, geometry, and trigonometric equation solving

E. *Technology: Works with a variety of technologies*
   1. selects appropriate calculator to meet the needs of the course
   2. selects appropriate methods to solve mathematical problems
   3. selects appropriate measurement procedures
   4. applies mathematical problem solving skills using a scientific calculator

II. FOUNDATION SKILLS

A. *Basic Skills: Reads, writes, performs arithmetic and mathematical operations, listens and speaks.*
   1. *Reading: Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
      a. interprets word problems, tables, graphs, and drawings to identify presented problem (s)
      b. reads and studies textbook, available tutorials, and video tapes
      c. uses available tutorials in the laboratory as needed
   2. *Writing: Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
      a. communicates problem solving skills by solving mathematical problems in writing using presented information
      b. maintains a lecture notebook
      c. completes all written assignments
   3. *Arithmetic/Mathematics: Perform basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques*
      a. performs applied computations of arithmetic, algebra, geometry, and trigonometry
      b. performs applied computations of measurement conversions
   4. *Listening: Receives, attends to, interprets, and responds to verbal messages and other cues*
      a. assimilate classroom instruction
      b. interpret and assimilate video instruction
      c. observe laboratory demonstrations
      d. seek and receive individualized instruction in the laboratory
      e. participates as an active listener in classroom instruction
   5. *Speaking: Organizes ideas and communicates orally*

        a. participates in classroom discussions
        b. organizes ideas and communicates specific questions to the instructor
        c. verbally affirms understanding of a concept, procedure, or required mathematical skill
        d. communicates with peers

B. *Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*
    1. ***Creative Thinking:*** *Generates new ideas*
        a. develops new ideas for approaching problem solving
        b. participates in the "brain-storming" process
        c. participates in group problem solving process
        d. practices the team approach to problem solving
    2. ***Decision Making:*** *Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
        a. identifies personal goals
        b. selects specific math applications
    3. ***Problem Solving:*** *Recognizes problems and devises and implements plan of action*
        a. makes daily accommodations to stay on schedule
        b. seeks additional instruction/clarification for assignment completion
        c. balances social and academic life/responsibilities
        d. accepts responsibility
    4. ***Seeing Things In the Mind's Eye:*** *Organizes, and processes symbols, pictures, graphs, objects, and other information*
        a. prepares sketches, graphs, and tables to assist in understanding word problems
        b. interprets word problems
        c. assimilates arithmetic problems in class
        d. interprets non-verbal communication in the classroom
    5. ***Knowing How to Learn:*** *Use efficient learning techniques to acquire and apply new knowledge and skills*
        a. recognizes relevant information to solve specific problem(s)
        b. identifies "given" data and applies appropriate equations
        c. demonstrates mastery of basic math skills
        d. uses sequential math skills to support mastery of new skills
        e. thinks through the problem mentally before selecting appropriate formula(e)/equation(s)
    6. ***Reasoning:*** *Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
        a. understands that the ability to apply mathematics requires "practice"
        b. understands the necessity to perform math as applied to specific technology
        c. selects appropriate mathematical application after considering all given data

C. ***Personal Qualities:*** *Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*

1. *Responsibility: Exerts a high level of effort and perseveres towards goal attainment*
    a. develops an understanding that in order to be successful in mathematics, preparation for the day's work is necessary
    b. develops an understanding that classroom attendance is essential for success in the course
    c. accepts the responsibility for active participation in class
2. *Self-Esteem: Believes in own self-worth and maintains a positive view of self*
    a. learns to take pride in his or her work through positive reinforcement
    b. sees himself or herself as an asset to the class through continued contributions to the group and a shared common goal
    c. understands that an individual with a positive attitude and the belief in their own abilities will systematically seek solutions and be a valuable employee
    d. accepts shared common goals of the class and views each individual as an asset to the group
3. *Sociability: Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
    a. assist classmates in improving mathematical skills
    b. assist students with special needs as a peer mentor
    c. share laboratory resources
    d. assist classmates in understanding math applications in a group
4. *Self-Management: Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
    a. maintain a record of academic achievement (individual grade book)
    b. accept the responsibility for self-management
    c. set goals and complete assigned tasks
5. *Integrity/Honesty: Chooses ethical courses of action*
    a. accept the responsibility for own actions
    b. exhibit personal honesty at all times
    c. accept the challenge of doing your own work in the laboratory, during examination, and on outside assignments
    d. understand the consequences of unethical behaviors

GENERAL EDUCATION COURSES

Today's technology has created an information revolution. As machines become smarter, the employees who will use or operate these machines must also become smarter. Simply possessing good technical (hands-on) skills will not guarantee success in today's job market. The workplace of today demands that its operators are fully competent technicians. Also, front line managers must possess a much higher level of academic skills than was once thought necessary. This means that everyone involved in education must focus more on the "three R's" (reading, writing and arithmetic). America went through a period when they divided students into two groups: "College Bound" and "Vocational." This philosophy seemed to work well for many years, but with computer controlled machines and systems now commonplace on the shop floor, today's workers find more needs for reading, writing and doing manufacturing related computations. With the emphasis on total quality assurance and team management, a young person entering the workforce must possess good reading, writing and communication skills to survive and advance up through the ranks.

MAST has written each of the general education course syllabi for use in vocational/industrial training/educational colleges. Each of the course syllabi includes SCANS activities which may be useful in helping to foster some leadership traits which were found desirable by companies when the industrial interviews were conducted.

GENERAL EDUCATION COURSES

Course	Title	Credit Hours
ENGLISH	Oral/Written Communications	3
ENGLISH	Introduction to Technical Communications	3
ENGLISH	Interpersonal Communications	3
ENGLISH	Composition I	3
MATH	College Algebra	3
MATH	Plane Trigonometry	3
MATH	Occupational Mathematics	4
PHYSICS	Elementary Physics	3
PSYCHOLOGY	Human Relations	3
PSYCHOLOGY	College Success Skills	1
PSYCHOLOGY	General Psychology	3

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MAST

GENERAL EDUCATION
COURSE SYLLABUS

ORAL/WRITTEN COMMUNICATIONS

MAST PROGRAM
COURSE SYLLABUS
ORAL/WRITTEN COMMUNICATIONS

Lecture hours/week: 3 **Lab hours/week: 0** **Credit hours: 3**

COURSE DESCRIPTION:

The techniques of oral and written communications most needed by the entry level technician. Emphasis will be on oral communications situations between peers, between technician and supervisor or subordinate, and between technician and groups.

PREREQUISITES: **NONE**

REQUIRED COURSE MATERIALS:

Recommended Textbook:	Technical Writing, Process and Product, Gerson, S.J. and Gerson, S.M., Prentice Hall, Inc., 1992, ISBN # 0-13-721440-5
Supplies:	8½ x 11 inch notebook paper - 200 sheets Erasable Ballpoint Pen (blue or black) - 2 Typing Paper - 25 sheets #2 Pencils - 2 Paperback Dictionary (your choice) Scantrons (2 packages) Notebook

COURSE OBJECTIVES:

Upon completion of the course, the student will be able to do the following:

1. understand and identify the principles of oral and written communication;
2. apply principles of English grammar to proofread and edit written material;
3. prepare a resume and letter of application;
4. after viewing a sample job interview, answer a set of questions with at least 70% accuracy;
5. recognize various business reports and memo formats;
6. prepare selected oral and written reports and memos;
7. recognize various business letter formats; and
8. prepare selected business letters.

COURSE OUTLINE:

Topics	Contact Hrs.
Orientation and Introductory Assignments	3
Introductory Speeches	3

Reading and Listening Skills		3
Communicating by Writing		3
Communicating by Writing (continued)		3
Oral Communication		3
Nonverbal Communication		3
Communication Problems		3
Communicating Up, Down, Across		3
Getting a Job/Filling Out Forms		3
The Interview Process		3
Final Exam/Course Wrap-up		3
	Total Lecture Hours	**36**

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. **COMPETENCIES**
  A. *Resources: Identifies, organizes, plans, and allocates resources*
    1. follows a schedule to complete assigned tasks on time
    2. provides a self-evaluation of performance based on the time and quality of work
    3. prepares and formulates short reports, memos, and letters
  B. *Interpersonal: Works with others*
    1. participates as a member of a team through class discussions and group projects; works cooperatively with others and contributes to the group process with ideas and suggestions
    2. provides feedback to peers and instructors
    3. works with diversity through interaction with class members of varied ethnic, religious, and social backgrounds
  C. *Information: Acquires and uses information*
    1. acquires and evaluates information through preparing graphs and charts and interpreting these graphs and charts
    2. organizes and maintains information by formulating letters, memos, and short reports; also uses critical thinking skills in making decisions, presenting informative, and demonstration speeches
    3. interprets articles from periodicals, newsletters, etc., relevant to individual student's major and prepares short interpretive reports
    4. uses computers to prepare various required writing assignments

D. *Systems: Understands complex inter-relationships*
  1. understands systems; performs various tasks in the writing lab using appropriate computer software
  2. demonstrates knowledge and organizational structure and uses the chain of command
  3. monitors and corrects performance during the writing process in the writing lab

E. *Technology: Works with a variety of technologies*
  1. selects technology; applies computer and writing skills in the writing lab by using appropriate software
  2. monitors and corrects performance; understands proper procedures for set up of computer and its software to meet individual writing needs

II. FOUNDATION SKILLS

A. ***Basic Skills:*** *Reads, writes, performs arithmetic and mathematical operations, listens, and speaks.*
  1. ***Reading:*** *Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
    a. reads and studies textbook and reading assignments
    b. interprets reading assignments
    c. locates and interprets written information including graphs, charts and periodical articles
    d. interprets class schedule
  2. ***Writing:*** *Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
    a. completes written assignments, including memos, letters, graphs, and charts
    b. takes class notes
  3. ***Listening:*** *Receives, attends to, interprets, and responds to verbal messages and other cues*
    a. receives/interprets lecture material
    b. responds to verbal messages
    c. confirms verbal message interpretations with instructor and peers, both in and out of class
    d. makes appropriate behavior responses to verbal messages
    e. participates in discussion and identification of the difference between listening and hearing
  4. ***Speaking:*** *Organizes ideas and communicates orally*
    a. participates in classroom discussions
    b. organizes ideas and communicates specific questions to the instructor
    c. verbally affirms understanding of a concept, procedure, or required skill
    d. communicates with peers to ensure the smooth and safe operation of the laboratory

B. ***Thinking Skills:*** *Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*

1. ***Creative Thinking***: *Generates new ideas*
    a. develops new ideas for approaching problem solving
    b. participates in the "brain-storming" process
    c. participates in group problem solving process
    d. practices the team approach to problem solving

2. ***Decision Making:*** *Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
    a. identifies personal goals
    b. identifies actions required to accomplish personal goals

3. ***Problem Solving:*** *Recognizes problems and devises and implements plan of action*
    a. makes daily accommodations to stay on schedule
    b. seeks additional instruction/clarification for assignment completion
    c. balances social and academic life/responsibilities
    d. accepts responsibility

4. ***Seeing Things In the Mind's Eye:*** *Organizes and processes symbols, pictures, graphs, objects, and other information*
    a. Interprets basic graphs and inspection reports; identifies inspection report symbols
    b. interprets non-verbal communication in the classroom

5. ***Knowing How to Learn:*** *Uses efficient learning techniques to acquire and apply new knowledge and skills*
    a. develops techniques for adapting learning style for differences in teaching style
    b. utilizes techniques for creative thinking
    c. develops strategies for effective problem solving approaches

6. ***Reasoning:*** *Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
    a. performs self-analysis of effective learning styles for specific situations
    b. selects appropriate communication form (oral vs. written) to effectively apply communication skills "on-the-job"
    c. communicates effectively within the workplace hierarchy

C ***Personal Qualities:*** *Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*

1. ***Responsibility:*** *Exerts a high level of effort and perseveres towards goal attainment*
    a. develops stress management techniques that facilitate and encourage achievement of academic and personal goals
    b. accepts responsibility for effective written and oral communication "on-the-job"

2. ***Self-Esteem:*** Believes in own self-worth and maintains a positive view of self
    a. develops interpersonal skills permitting a positive projection of self

3. ***Sociability:*** Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings
    a. develops effective communication across cultures

   b. interacts with peers and listens effectively and provides constructive criticism
   c. learns to distinguish between sympathy and empathy

4. ***Self-Management:*** Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control
   a. monitors/assesses personal goal progress
   b. performs goal setting activities such as resume preparation, completion of job application forms, and refinement of interviewing skills

5. ***Integrity/Honesty:*** *Chooses ethical courses of action*
   a. meets specific criteria standards to successfully complete the course
   b. encouraged to accept ethical and honest courses of action set by example
   c. provide situations and group activities for students to explore and formulate professional and personal ethical standards

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MAST

GENERAL EDUCATION
COURSE SYLLABUS

INTRODUCTION TO TECHNICAL COMMUNICATIONS

MAST PROGRAM
COURSE SYLLABUS
INTRODUCTION TO TECHNICAL COMMUNICATIONS

Lecture hours/week: 2 **Lab hours/week: 2** **Credit hours: 3**

COURSE DESCRIPTION:

Introduction to the nature of the communicative skills and thinking processes, with practical exercises in writing, reading, speaking, spelling, and vocabulary as related to technical areas.

PREREQUISITES: **NONE**

REQUIRED COURSE MATERIALS:

Recommended Textbooks:	Writing That Works, Oliu, Walter E., et. al., 5th ed., New York: St. Martin's Press, 1992 Webster's New World Dictionary (or any comprehensive dictionary)
Supplies:	8-1/2 " 3-ring college rules white notebook paper erasable ball-point pen (one) ball-point pens (2) liquid paper scantron sheets, # 882, one package

COURSE OBJECTIVES:

Upon successful completion of Introduction to Technical Communications, the student will:

1. write coherent paragraphs which contain topic sentences and display proper composition techniques;
2. organize and write short reports;
3. compose business letters using proper style and form;
4. prepare a resume and letter of application to present to a prospective employer;
5. use outlining techniques to organize written and oral assignments;
6. deliver a well-prepared, concise, interesting oral report;
7. utilize the library; and
8. speak and write with improved grammar.

LECTURE OUTLINE:

Lecture Topics	Text Reference Page	Contact Hrs.
Orientation		1
Review of Grammar and Punctuation		4
Paragraph Writing with Emphasis on		3

Unity, Coherence, Good Sentences, and Correct Grammar and Punctuation	
Basic Computer Writing Skills	
Structuring and Outline; Writing an Explanation of Process	2
Achieving Emphasis in Writing: Subordination and Voice	2
Organizing Information; Seven Methods of Organization	2
Writing Strategies; Description and Comparison	2
Business Correspondence: Techniques of Letter Writing	4
Preparation for Work Force: Job Application, Preparation of Resume, Interview Techniques, Oral Reporting	4
Total Lecture Hours	**24**

LAB OUTLINE:

Lab Topics	Contact Hrs.
Working Exercises in Grammar and Punctuation: Correcting Exercises	2
Writing Paragraphs in Class; Presenting Rough Drafts for Constructive Criticism and Correction by Instructor	2
Structuring Outlines and Writing a Rough Draft of a Process Explanation	2
Working Exercises in Subordination, Voice, and Parallel Construction	2
Preparing a Formal Outline; Writing a Rough Draft of a Brief Technical Paper	2
Preparing Outlines for Papers to be Written Using Description and Comparison	2
Writing Rough Drafts of Business letters for Constructive Criticism by Instructor	2
Writing Letters of Applications, Resumes, filling out job applications	3
Testing	10
Total Lab Hours	**24**

COURSE OBJECTIVES: SCANS COMPETENCIES

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The following activities will be performed by each student for successful completion of this course:

I. COMPETENCIES
   - *A.* ***Resources:*** *Identifies, organizes, plans, and allocates resources*
      1. follows a schedule to complete assigned tasks on time
      2. provides a self-evaluation of performance based on the time and quality of work
      3. prepares and formulates short reports, memos, and letters
   - *B.* ***Interpersonal:*** *Works with others*
      1. participates as a member of a team through class discussions and group projects; works cooperatively with others and contributes to the group process with ideas and suggestions
      2. provides feedback to peers and instructors
      3. works with diversity through interaction with class members of varied ethnic, religious, and social backgrounds
   - *C.* ***Information:*** *Acquires and uses information*
      1. acquires and evaluates information through preparing graphs and charts and interpreting these graphs and charts
      2. organizes and maintains information by formulating letters, memos, and short reports; also uses critical thinking skills in making decisions, presenting informative, and demonstration speeches
      3. interprets articles from periodicals, newsletters, etc., relevant to individual student's major and prepares short interpretive reports
      4. uses computers to prepare various required writing assignments
   - *D.* ***Systems:*** *Understands complex inter-relationships*
      1. understands systems; performs various tasks in the writing lab using appropriate computer software
      2. demonstrates knowledge and organizational structure and uses the chain of command
      3. monitors and corrects performance during the writing process in the writing lab
   - *E.* ***Technology:*** *Works with a variety of technologies*
      1. selects technology; applies computer and writing skills in the writing lab by using appropriate software
      2. monitors and corrects performance; understands proper procedures for set up of computer and its software to meet individual writing needs

II. FOUNDATION SKILLS
   - *A.* ***Basic Skills:*** *Reads, writes, performs arithmetic and mathematical operations, listens, and speaks.*
      1. ***Reading:*** *Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*

        a. reads and studies textbook and reading assignments
        b. interprets reading assignments
        c. locates and interprets written information including graphs, charts and periodical articles
        d. interprets class schedule
    2. ***Writing:*** *Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
        a. completes written assignments, including memos, letters, graphs, and charts
        b. takes class notes
    3. ***Listening:*** *Receives, attends to, interprets, and responds to verbal messages and other cues*
        a. receives/interprets lecture material
        b. responds to verbal messages
        c. confirms verbal message interpretations with instructor and peers, both in and out of class
        d. makes appropriate behavior responses to verbal messages
        e. participates in discussion and identification of the difference between listening and hearing
    4. ***Speaking:*** *Organizes ideas and communicates orally*
        a. participates in classroom discussions
        b. organizes ideas and communicates specific questions to the instructor
        c. verbally affirms understanding of a concept, procedure, or required skill
        d. communicates with peers to ensure the smooth and safe operation of the laboratory

B. ***Thinking Skills:*** *Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*
    1. ***Creative Thinking:*** *Generates new ideas*
        a. develops new ideas for approaching problem solving
        b. participates in the "brain-storming" process
        c. participates in group problem solving process
        d. practices the team approach to problem solving
    2. ***Decision Making:*** *Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
        a. identifies personal goals
        b. identifies actions required to accomplish personal goals
    3. ***Problem Solving:*** *Recognizes problems and devises and implements plan of action*
        a. makes daily accommodations to stay on schedule
        b. seeks additional instruction/clarification for assignment completion
        c. balances social and academic life/responsibilities
        d. accepts responsibility
    4. ***Seeing Things In the Mind's Eye:*** *Organizes and processes symbols, pictures, graphs, objects, and other information*

        a. interprets basic graphs and inspection reports; identifies inspection report symbols
        b. interprets non-verbal communication in the classroom
    5. ***Knowing How to Learn:*** *Uses efficient learning techniques to acquire and apply new knowledge and skills*
        a. develops techniques for adapting learning style for differences in teaching style
        b. utilizes techniques for creative thinking
        c. develops strategies for effective problem solving approaches
    6. ***Reasoning:*** *Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
        a. performs self-analysis of effective learning styles for specific situations
        b. selects appropriate communication form (oral vs. written) to effectively apply communication skills "on-the-job"
        c. communicates effectively within the workplace hierarchy

C. ***Personal Qualities:*** *Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*
    1. ***Responsibility:*** *Exerts a high level of effort and perseveres towards goal attainment*
        a. develops stress management techniques that facilitate and encourage achievement of academic and personal goals
        b. accepts responsibility for effective written and oral communication "on-the-job"
    2. ***Self-Esteem:*** *Believes in own self-worth and maintains a positive view of self*
        a. develops interpersonal skills permitting a positive projection of self
    3. ***Sociability:*** *Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
        a. develops effective communication across cultures
        b. interacts with peers and listens effectively and provides constructive criticism
        c. learns to distinguish between sympathy and empathy
    4. ***Self-Management:*** *Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
        a. monitors/assesses personal goal progress
        b. performs goal setting activities such as resume preparation, completion of job application forms, and refinement of interviewing skills
    5. ***Integrity/Honesty:*** *Chooses ethical courses of action*
        a. meets specific criteria standards to successfully complete the course
        b. encouraged to accept ethical and honest courses of action set by example
        c. provide situations and group activities for students to explore and formulate professional and personal ethical standards

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MAST

GENERAL EDUCATION
COURSE SYLLABUS

INTERPERSONAL COMMUNICATIONS

MAST PROGRAM
COURSE SYLLABUS
INTERPERSONAL COMMUNICATIONS

Lecture hours/week: 4 **Lab hours/week: 0** **Credit hours: 3**

COURSE DESCRIPTION:

Theories and exercises in verbal and nonverbal communication with a focus on interpersonal relationships. Students will study internal and external factors that impact communication, clarification, and conflict resolution.

PREREQUISITE: Composition I

REQUIRED COURSE MATERIALS:

RECOMMENDED TEXT: Understanding Human Communication, Alder, Ronald B., and George Rodman, New York: HBJ, 1994, Fifth ed.

SUPPLIES:
Notebook paper
Spiral notebook
Ball point pens (black)
Pencils #2
Scantron forms
Liquid paper

COURSE OBJECTIVES:

Upon completion of this course, the student will:
1. Employ models to demonstrate his/her communication effectiveness
2. Develop a self-concept that enhances communication
3. Engage in effective perception-checking
4. Distinguish between debilitative and facilitative emotions and demonstrate methods for managing them
5. Recognize the role of nonverbal behavior in decoding messages
6. Demonstrate the use of several effective listening response styles
7. Identify and describe key aspects of interpersonal relationships
8. Use feedback to confirm messages
9. Demonstrate non-defensive responses to criticism
10. Demonstrate the ability to make effective oral presentations

COURSE OUTLINE

Topics	Contact Hrs.
Orientation	2
Booklists	
Course Expectations	
Autograph Party	
A First Look at Interpersonal Relationships	4
A First Look	
Class Response (discussion)	
Coat of Arms (or Bag Speech)	
Evaluation	
The Self-Concept: Key to Communication	4
Examination of the Self-Concept	
Class Response (discussion)	
Presentations	
Evaluation	
Perception: What you see is what you get.	4
Lecture on Perception	
Class Response (discussion)	
Presentations	
Evaluation	
Emotions: Thinking and Feeling	4
Lecture on Emotions	
Class Response (discussion)	
Presentations	
Evaluation	
Midterm Exam	2
Nonverbal Communication	4
Lecture on Nonverbal Communication	
Class Response (discussion)	
Presentations	
Evaluation	
Listening vs. Hearing	6
Lecture on Listening	
Class Response (discussion)	
Presentations	
Evaluation	
Intimacy and Distance in Relationships	4
Lecture on Interpersonal Relationships	
Class Response (discussion)	
Presentations or other activity	
Evaluation	
Improving Communications Climates	4
Lecture on Communication Climates	
Class Response (discussion)	
Presentations or other activity	
Evaluation	

Resolving Interpersonal Conflicts	6
Lecture on Resolving Conflicts	
Class Response	
Presentations or other activity	
Evaluation	
OR	
A movie that incorporates interpersonal concepts	
Movie (1st 50 minutes)	
Movie (2nd 50 minutes)	
Complete movie	
Discuss movie	
Final Exam	2
Completion of Course	2
Student Conferences	
Course Wrap-Up	—
Total Lecture Hours	**48**

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. COMPETENCIES

- *A. Resources: Identifies, organizes, plans, and allocates resources*
  1. follows a schedule to complete assigned tasks "on time"
  2. assesses academic progress, enters grades on a progress sheet, evaluates individual performance, and distributes work accordingly, providing feedback to the instructor
- *B. Interpersonal: Works with others*
  1. participate in group activities to review essays, anticipate questions for examinations, and participate in study groups
  2. participate as a "group leader" to coordinate/facilitate activities such as problem solving, individual participation, and provide feedback to the instructor
  3. work well with others from diverse backgrounds, including gender, ethnicity, race, and career goals diversities
- *C. Information: Acquires and uses information*

1. perform critical analysis exercises and communicate in both oral and written form to classmates and instructors
2. prepare critical essays
3. interprets essays and communicates individual interpretations to the class in both written and oral form
4. prepare essays and papers on the computer using appropriate software applications

D. *Systems: Understands complex inter-relationships*

1. understand systems; comprehends categorical organizational systems such as library classification of books, advertisements, and how writers use classification to organize ideas

E. *Technology: Works with a variety of technologies*

1. selects technology; selects appropriate software applications
2. applies technology to tasks; uses computer software applications and tutorial programs

II. FOUNDATION SKILLS

A. ***Basic Skills:*** *Reads, writes, performs arithmetic and mathematical operations, listens, and speaks.*

1. ***Reading:*** *Locates, understands, and interprets written information in prose and in documents, such as manuals, graphs, and schedules*
    a. reading assignments are interpreted by individual students and in groups
    b. students locate written passages which illustrate specific ideas
    c. students interpret different styles of writing
2. ***Writing:*** *Communicates thoughts, ideas, information, and messages in writing; and creates documents, such as letters, directions, manuals, reports, graphs, and flow charts*
    a. students are required to write critical essays
    b. students are required to write critical analysis of writings
3. ***Listening:*** *Receives, attends to, interprets, and responds to verbal messages and other cues*
    a. listens to individual interpretations of essays and responds within the group to expressed interpretations
4. ***Speaking:*** *Organizes ideas and communicates orally*
    a. participates in classroom discussions
    b. organize ideas and communicates specific questions to the instructor
    c. verbally affirms understanding of a concept, procedure, or required skill

B. ***Thinking Skills:*** *Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn, and reasons.*

1. ***Creative Thinking:*** *Generates new ideas*
    a. able to respond to diverse interpretations
    b. identifies actions required to accomplish personal goals
2. ***Decision Making:*** *Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*

a. evaluates performance and selects appropriate actions
b. identifies personal goals

3. ***Problem Solving:*** *Recognizes problems and devises and implements plan of action*
    a. makes daily accommodations to stay on schedule
    b. seeks additional instruction/clarification for assignment completion
    c. balances social and academic life/responsibilities
    d. accepts responsibility
    e. evaluates grammar, sentence structure, body of paper, etc., and takes appropriate actions
4. ***Seeing Things In the Mind's Eye:*** *Organizes and processes symbols, pictures, graphs, objects, and other information.*
    a. understands both written and verbal instructions
5. ***Knowing How to Learn:*** *Use efficient learning techniques to acquire and apply new knowledge and skills*
    a. learns to anticipate examination questions, categorize, describe, and explain efficient learning techniques
    b. uses these sequential skills to support mastery of new skills
6. ***Reasoning:*** *Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
    a. applies rules of word choice in composing essays

C. ***Personal Qualities:*** *Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*

1. ***Responsibility:*** *Exerts a high level of effort and perseveres towards goal attainment*
    a. attends class, meets deadlines, and writes legibly
    b. develops an understanding that in order to be successful in English, preparation for the day's work is necessary
    c. accepts the responsibility for active participation in class
2. ***Self-Esteem:*** *Believes in own self-worth and maintains a positive view of self*
    a. learns to take pride in his or her work through positive reinforcement
    b. sees himself or herself as an asset to the class through continued contributions to the group and a shared common goal
3. ***Sociability:*** *Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
    a. participate in small group discussions
    b. assist students with special needs as a peer mentor
4. ***Self-Management:*** *Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
    a. maintain a record of academic achievement and monitor progress
    b. accept the responsibility for self-management
    c. set goals and complete assigned tasks
    d. monitors personal goal progress
5. ***Integrity/Honesty:*** *Chooses ethical courses of action*
    a. accept the responsibility for own actions

b. exhibits personal honesty at all times
c. accept the challenge of doing own work in class and on outside assignments
d. accept the responsibility of doing own work on examinations
e. understand the consequences of unethical behavior

ENG 134
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*M*achine Tool *A*dvanced *S*kills
*T*echnology Program

MAST

GENERAL EDUCATION
COURSE SYLLABUS

COMPOSITION I

MAST PROGRAM
COURSE SYLLABUS
COMPOSITION I

Lecture hours/week: 4 **Lab hours/week: 0** **Credit hours: 3**

COURSE DESCRIPTION:

Students study the process of composing essays, including pre-writing techniques, drafting, and revising and editing. Students write several multi-paragraph essays of various types, in both in-class and out-of-class settings. Students critically analyze sample student and professional essays. Prerequisite: Writing Skills II or equivalent as determined by the English placement test.

PREREQUISITE: **Writing Skills II or equivalent as determined by the English placement test.**

REQUIRED COURSE MATERIALS:

Recommended Textbook: Strategies for Successful Writing, Reinking, James A., and Hart, Andrew W., Second Edition, Englewood Cliffs, N. J.: Prentice-Hall 1991

College Level Dictionary

Supplies:
Large package of Notebook Paper
Liquid Paper (one bottle)
Ballpoint pens (blue or black)
#2 Pencils
Package of Scantron Forms
5-1/4" disk

COURSE OBJECTIVES:

Upon completion of this course, the student will:

1. Select a clearly defined subject and address it to a specific audience in a logical manner
2. Develop a unified and coherent theme that uses standard American grammar
3. Use a handbook and a dictionary as resources for writing
4. Compose written assignments using various strategies of informative and persuasive prose
5. Compose well organized answers to questions posed on written examinations
6. Critically analyze assigned essays

COURSE OUTLINE:

Topics	Contact Hrs.
Orientation	2
A. Initial Writing Assignment	

B.	Testing	
Paragraph to Essay		5
A.	Purpose and Audience	
B.	Planning and Organization of a Paragraph	
C.	Expanding the Paragraph to an Essay	
D.	Peer Editing	
Types of Compositions		27
A.	Description	
B.	Process *	
C.	Comparison - Analogy *	
D.	Classification *	
E.	Cause and Effect *	
F.	In-class Essay	
Practical Applications		10
A.	Essay Examinations	
B.	Critical Analysis	
Conclusion		4
A.	Preparation for Final Exam	
B.	Final Exam (required in order to receive a passing grade in the course)	
C.	Student Conferences	—
	Total Lecture Hours	**48**

* may be persuasive or informative

COURSE OBJECTIVES: SCANS COMPETENCIES:

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. COMPETENCIES

- *A. Resources: Identifies, organizes, plans, and allocates resources*
  1. follows a schedule to complete assigned tasks "on time"
  2. assesses academic progress, enters grades on a progress sheet, evaluates individual performance, and distributes work accordingly, providing feedback to the instructor
- *B. Interpersonal: Works with others*
  1. participate in group activities to review essays, anticipate questions for examinations, and participate in study groups

2. participate as a "group leader" to coordinate/facilitate activities such as problem solving, individual participation, and provide feedback to the instructor
3. work well with others from diverse backgrounds, including gender, ethnicity, race, and career goals diversities

C. *Information: Acquires and uses information*
1. perform critical analysis exercises and communicate in both oral and written form to classmates and instructors
2. prepare critical essays
3. interprets essays and communicates individual interpretations to the class in both written and oral form
4. prepare essays and papers on the computer using appropriate software applications

D. *Systems: Understands complex inter-relationships*
1. understand Systems; comprehends categorical organizational systems such as library classification of books, advertisements, and how writers use classification to organize ideas

E. *Technology: Works with a variety of technologies*
1. selects technology; selects appropriate software applications
2. applies technology to tasks; uses computer software applications and tutorial programs

II. FOUNDATION SKILLS

A. *Basic Skills: Reads, writes, performs arithmetic and mathematical operations, listens, and speaks.*

1. *Reading: Locates, understands, and interprets written information in prose and in documents, such as manuals, graphs, and schedules*
   a. reading assignments are interpreted by individual students and in groups
   b. students locate written passages which illustrate specific ideas
   c. students interpret different styles of writing
2. *Writing: Communicates thoughts, ideas, information, and messages in writing; and creates documents, such as letters, directions, manuals, reports, graphs, and flow charts*
   a. students are required to write critical essays
   b. students are required to write critical analysis of writings
3. *Listening: Receives, attends to, interprets, and responds to verbal messages and other cues*
   a. listens to individual interpretations of essays and responds within the group to expressed interpretations
4. *Speaking: Organizes ideas and communicates orally*
   a. participates in classroom discussions
   b. organize ideas and communicates specific questions to the instructor
   c. verbally affirms understanding of a concept, procedure, or required skill

B. *Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn, and reasons.*

1. ***Creative Thinking:*** *Generates new ideas*
    a. able to respond to diverse interpretations
    b. identifies actions required to accomplish personal goals
2. ***Decision Making:*** *Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
    a. evaluates performance and selects appropriate actions
    b. identifies personal goals
3. ***Problem Solving:*** *Recognizes problems and devises and implements plan of action*
    a. makes daily accommodations to stay on schedule
    b. seeks additional instruction/clarification for assignment completion
    c. balances social and academic life/responsibilities
    d. accepts responsibility
    e. evaluates grammar, sentence structure, body of paper, etc., and takes appropriate actions
4. ***Seeing Things In the Mind's Eye:*** *Organizes and processes symbols, pictures, graphs, objects, and other information.*
    a. understands both written and verbal instructions
5. ***Knowing How to Learn:*** *Use efficient learning techniques to acquire and apply new knowledge and skills*
    a. learns to anticipate examination questions, categorize, describe, and explain efficient learning techniques
    b. uses these sequential skills to support mastery of new skills
6. ***Reasoning:*** *Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
    a. applies rules of word choice in composing essays

C. ***Personal Qualities:*** *Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*

1. ***Responsibility:*** *Exerts a high level of effort and perseveres towards goal attainment*
    a. attends class, meets deadlines, and writes legibly
    b. develops an understanding that in order to be successful in English, preparation for the day's work is necessary
    c. accepts the responsibility for active participation in class
2. ***Self-Esteem:*** *Believes in own self-worth and maintains a positive view of self*
    a. learns to take pride in his or her work through positive reinforcement
    b. sees himself or herself as an asset to the class through continued contributions to the group and a shared common goal
3. ***Sociability:*** *Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
    a. participate in small group discussions
    b. assist students with special needs as a peer mentor
4. ***Self-Management:*** *Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
    a. maintain a record of academic achievement and monitor progress
    b. accept the responsibility for self-management
    c. set goals and complete assigned tasks

    d. monitors personal goal progress

5. *Integrity/Honesty: Chooses ethical courses of action*
    a. accept the responsibility for own actions
    b. exhibits personal honesty at all times
    c. accept the challenge of doing own work in class and on outside assignments
    d. accept the responsibility of doing own work on examinations
    e. understand the consequences of unethical behavior

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MAST

GENERAL EDUCATION
COURSE SYLLABUS

COLLEGE ALGEBRA

MATH PROGRAM
COURSE SYLLABUS
COLLEGE ALGEBRA

Lecture hours/week: 4 **Lab hours/week: 0** **Credit hours: 3**

COURSE DESCRIPTION:

A study of quadratics; polynomial, rational, logarithmic and exponential functions; systems of equations; progressions; sequences and series; matrices and determinants.

PREREQUISITE: **Intermediate Algebra or equivalent as determined by Math Placement Exam**

REQUIRED COURSE MATERIALS:

Recommended Textbook: College Algebra, 3rd ed., Larson/Hostetler, D.C. Heath & Company, 1989

Supplies:
Textbook
Notebook paper
Graph paper (optional)
Pencils
Ruler
Scientific Calculator
Scantron form 882 w/100 answers

COURSE OBJECTIVES:

Upon completion of this course, the student will:

1. Solve linear, quadratic and absolute value equations and inequalities in one variable;
2. Define relation, function and inverse functions and graph linear, quadratic, polynomial and rational functions;
3. Solve systems of linear and nonlinear equations with two and three variables;
4. Define a matrix, perform operations with matrices, and find the inverse of a matrix;
5. Write the equation of a circle or parabola given specific characteristics and graph of both of these;
6. Determine the number of and nature of the roots of a polynomial equation and solve for them using synthetic division;
7. Define exponential and logarithmic functions, determine their properties and graphs and solve equations involving exponential and logarithmic functions;
8. Define the concepts of sequence and series and develop the properties for arithmetic, geometric and binomial series.

COURSE OUTLINE:

Topics	Contact Hrs.
Introduction to College Algebra	1
Algebraic Equations and Inequalities	8
A. Equations and Applications	
1. Linear	
2. Quadratic	
3. Other	
a. Higher Degree	
b. Radical	
c. Rational	
d. Absolute Value	
B. Complex Numbers	
C. Inequalities	
1. Linear	
2. Quadratic	
3. Cubic	
4. Rational	
5. Absolute value	
Functions and Graphs	9
A. The Cartesian Plane	
B. Graphing an Equation	
C. Lines in the Plane	
D. Functions	
1. Definition and Notation	
2. Graphs - include parabola	
3. Combinations	
a. Operations	
b. Composition	
4. Inverse	
Polynomial and rational Functions: Graphs and Zeros	10
A. Graphing and Finding Zeros	
1. Quadratic	
2. Higher Degree	
B. Polynomial and Synthetic Division	
C. Real Zeros	
1. Descarte's Rule of Signs	
2. Rational Zero Test	
3. Bounds	
D. Complex Zeros and the Fundamental Theorem of Algebra	
E. Approximation Techniques for Zeros	
F. Graphing Rational Functions	
Exponential and Logarithmic Functions	7
A. Exponential Functions	
1. Graphing	
2. Natural Base e	

3. Applications

B. Logarithmic Functions
    1. Graphing
    2. Natural Logarithmic Functions
    3. Change of Base

C. Properties of Logarithms

D. Solving Exponential and Logarithmic Equations

E. Applications

Systems of Equations and Matrices	6

A. Systems and Equations in Two Variables
    1. Graphing
    2. Substitution
    3. Elimination

B. Systems of Linear Equations in more than Two Variables
    1. Elimination in Row - echelon form
    2. Gaussian Elimination
    3. Gauss-Jordan Elimination

C. Operations with Matrices

D. The Inverse of a Matrix

Sequence and Series	6

A. Sequence and Summation

B. Arithmetic Sequences

C. Geometric Sequences and Series

D. The Binomial Theorem

Final Exam	2
Total Lecture Hours	**48**

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. **COMPETENCIES**

A. ***Resources:*** *Identifies, organizes, plans, and allocates resources*
    1. follows a schedule to complete assigned tasks on time
    2. provide a self-evaluation of performance based on the time and quality of work

3. assesses own skills to determine when to get extra help or use the math lab with videos, computers, tutorials, etc.

B. *Interpersonal: Works with others*
   1. participates in classroom dialogue, contributing to group effort in problem solving
   2. works well with all members of the class
   3. communicates ideas on take-home exams to justify answers

C. *Information: Acquires and uses information*
   1. apply mathematical solutions to problems assigned
   2. organize and maintain lecture notebook and assignment notebook
   3. communicates/interprets information by participating in classroom dialogue
   4. uses 050 computer tutorials as necessary
   5. acquires math material from the text, videos, and computers
   6. interprets information in problem solving situations on homework, lab worksheets, and exams
   7. uses the University of Arizona software to assist in graphing functions, solving equations, evaluating sequences, and performing matrix operations

D. *Systems: Understands complex inter-relationships*
   1. understands systems:
      a. applies a systematic approach to solving mathematical problems
      b. develops an understanding of mathematical system complexity with applications to algebra, geometry, and trigonometric equation solving
      c. operates within the organizational system of the class procedures to fulfill the requirements to pass the course
      d. understands the technological uses of the calculator and computer to know when and how to use them efficiently to complete algebra problems
   2. monitors and corrects performance:
      a. monitors own progress in the class and understanding of math concepts to know when to seek additional help
      b. decides what changes must occur in order to improve performance in algebra
      c. assesses learning style and adjusts study skills to enhance performance
   3. interprets and designs systems:
      a. student evaluations are requested and may provide recommendations for changes in teaching methods to enhance student understanding of mathematical concepts

E. *Technology: Works with a variety of technologies*
   1. selects technology:
      a. uses computers and graphing calculators to complete lab assignments, homework, and examinations
   2. applies technology to task:
      a. selects the appropriate technological tools to solve assigned problems
      b. selects appropriate methods to solve mathematical problems

        - c. understands the applications and capabilities of technological tools for problem solving relevant to this course
        - d. applies mathematical problem solving skills using a scientific calculator
    - 3. maintains and troubleshoots equipment:
        - a. maintains personal calculators

II. FOUNDATION SKILLS

- *A.* ***Basic Skills:*** *Reads, writes, performs arithmetic and mathematical operations, listens and speaks.*
    - *1.* ***Reading:*** *Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
        - a. interprets word problems, tables, graphs, and drawings to identify presented problem(s)
        - b. reads and studies textbook, available tutorials, and video tapes
        - c. uses available tutorials in the laboratory as needed
        - d. follows a daily schedule to maintain appropriate time-line for completing homework, lab exercises, and exams
    - *2.* ***Writing:*** *Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
        - a. communicates problem solving skills by solving mathematical problems in writing using presented information
        - b. maintains a lecture notebook
        - c. completes all written assignments
        - d. completes examinations, including definitions, problem solving, and concept explanations
        - e. submits written responses to chapter question assignments
    - *3.* ***Arithmetic/Mathematics:*** *Perform basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques*
        - a. adds, subtracts, multiplies, and divides all numbers in the complex number system, algebraic expressions, equations, and functions
        - b. analyzes and graphs functions and equations
        - c. solves application problems using algebraic, analytic, and geometric techniques
        - d. solves equations algebraically and geometrically
        - e. identifies functions and their graphs
    - *4.* ***Listening:*** *Receives, attends to, interprets, and responds to verbal messages and other cues*
        - a. listens to lectures and takes notes
        - b. listens to instructions for homework, laboratory, and examination assignments
        - c. listens to questions and responses of students participating in class discussions
        - d. interpret and assimilate video instruction
        - e. observe laboratory demonstrations

        - f. seek and receive individualized instruction in the laboratory
    - 5. *Speaking: Organizes ideas and communicates orally*
        - a. participates in classroom discussions
        - b. organize ideas and communicates specific questions to the instructor
        - c. verbally affirms understanding of a concept, procedure, or required mathematical skill
        - d. communicates with peers
        - e. assists others and participates in group activities
- B. *Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*
    - *1.* ***Creative Thinking:*** *Generates new ideas*
        - a. develops new ideas for approaching problem solving
        - b. participates in the "brain-storming" process
        - c. participates in group problem solving process
        - d. practices the team approach to problem solving
    - *2.* ***Decision Making:*** *Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
        - a. identifies personal goals
        - b. identifies actions required to accomplish personal goals
        - c. selects specific math applications
    - *3.* ***Problem Solving:*** *Recognizes problems and devises and implements plan of action*
        - a. makes daily accommodations to stay on schedule
        - b. seeks additional instruction/clarification for assignment completion
        - c. balances social and academic life/responsibilities
        - d. accepts responsibility
        - e. solves mathematical problems using an organized step-by-step approach
    - *4.* ***Seeing Things In the Mind's Eye:*** *Organizes, and processes symbols, pictures, graphs, objects, and other information*
        - a. prepares sketches, graphs, and tables to assist in understanding word problems
        - b. interprets word problems
        - c. assimilates arithmetic problems in class
        - d. interprets non-verbal communication in the classroom
        - e. understands both written and verbal instructions
    - *5.* ***Knowing How to Learn:*** *Use efficient learning techniques to acquire and apply new knowledge and skills*
        - a. recognizes relevant information to solve specific problem(s)
        - b. identifies "given" data and applies appropriate equations
        - c. demonstrates mastery of basic math skills
        - d. uses sequential math skills to support mastery of new skills
        - e. thinks through the problem mentally before selecting appropriate formula(e)/equation(s)
        - f. determines own learning style in order to apply proper skills to enhance learning

- g. uses previously acquired knowledge to assist in learning new concepts

6. *Reasoning: Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
    - a. understands that the ability to apply mathematics requires "practice"
    - b. understands the necessity to perform math as applied to specific technology
    - c. selects appropriate mathematical application after considering all given data
    - d. understands and applies the concepts/applications of theorems and algebraic rules
    - e. builds functions and equations describing the relationship between two or more quantities

C. *Personal Qualities: Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*

1. *Responsibility: Exerts a high level of effort and perseveres towards goal attainment*
    - a. develops an understanding that in order to be successful in mathematics, preparation for the day's work is necessary
    - b. develops an understanding that classroom attendance is essential for success in the course
    - c. accepts the responsibility for active participation in class
2. *Self-Esteem: Believes in own self-worth and maintains a positive view of self*
    - a. learns to take pride in his or her work through positive reinforcement
    - b. sees himself or herself as an asset to the class through continued contributions to the group and a shared common goal
    - c. understands that an individual with a positive attitude and the belief in their own abilities will systematically seek solutions and be a valuable employee
    - d. accepts shared common goals of the class and views each individual as an asset to the group
3. *Sociability: Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
    - a. assist classmates in improving mathematical skills
    - b. assist students with special needs as a peer mentor
    - c. share laboratory resources
    - d. assist classmates in understanding math applications in a group
    - e. conducts his or herself in class so as to not intimidate or ostracize others
    - f. uses appropriate language in class
4. *Self-Management: Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
    - a. maintain a record of academic achievement (individual grade book)
    - b. accept the responsibility for self-management

    c. set goals and complete assigned tasks
    d. seeks additional help from the instructor or math lab as needed

5. *Integrity/Honesty: Chooses ethical courses of action*
    a. accept the responsibility for own actions
    b. exhibit personal honesty at all times
    c. accept the challenge of doing your own work in the laboratory, during examination, and on outside assignments
    d. understand the consequences of unethical behaviors

*M*achine Tool *A*dvanced *S*kills
*T*echnology Program

MAST

GENERAL EDUCATION
COURSE SYLLABUS

PLANE TRIGONOMETRY

MAST PROGRAM
COURSE SYLLABUS
PLANE TRIGONOMETRY

Lecture hours/week: 4 **Lab hours/week: 0** **Credit hours: 3**

COURSE DESCRIPTION:

Topics in trigonometric functions, right triangles, trigonometric identities, radian measure, graphs of periodic functions, and oblique triangles.

PREREQUISITE: **College Algebra**

REQUIRED COURSE MATERIALS:

Recommended Textbook: Trigonometry, Lial, Miller, & Hornsby, Scott Foresman Pub., 5th ed.

Supplies:
Notebook Paper
Pencils
Scientific Calculator
Scantron form 882 w/100 answers

COURSE OBJECTIVES:

Upon completion of this course, the student will:
1. Find the distance between two points.
2. Define the trigonometric functions.
3. Solve right triangles.
4. Find the function values of any angle.
5. State and use fundamental relationships of trigonometric functions.
6. Graph trigonometric functions.
7. Verify trigonometric identities.
8. Solve trigonometric equations.
9. Graph the inverse sine, cosine, and tangent functions.
10. Solve oblique triangles by the Law of Sines and the Law of Cosines.
11. Perform operations on the set of complex numbers in both rectangular and polar form.
12. Graph complex numbers
13. Solve applied problems using vectors, radian measure, linear and angular velocity, arc length, area of a sector, trigonometric equations, and inverse functions.

COURSE OUTLINE:

Topics	Contact Hrs.
Introduction to College Algebra	1
The Trigonometric Functions	11

A.	Basic Terms of Trigonometry	
B.	Definitions of the Trigonometric Functions	
C.	Trigonometric Functions of Acute Angles	
D.	Trigonometric Functions of Special Angles	
E.	Using Reference Angles and the Trigonometric Tables	
F.	Solving Right Triangles	
G.	Applications of Right Triangles	
Radian Measure		5
A.	Radian Measure Conversions	
B.	Formulae for Arc Length and Area of a Sector	
C.	Linear and Angular Velocity Formulae	
D.	Circular Functions of Real Numbers	
Graphs of Trigonometric Functions		5
A.	Graphs of the Sine and Cosine Functions	
B.	Horizontal Translations: Phase Shift	
C.	Graphs of other Trigonometric Functions	
Trigonometric Identities		7
A.	Fundamental Identities	
B.	Verifying Trigonometric Identities	
C.	Identities Involving Sums and Differences of Two Angles	
D.	Double and Half-Angle Identities	
Inverse Trigonometric Functions and Trigonometric Equations		4
A.	Inverse Functions	
B.	Inverse Trigonometric Functions	
C.	Trigonometric Equations	
D.	Inverse Trigonometric Equations	
Oblique Triangles and Vectors		7
A.	Law of Sines	
B.	The Ambiguous Case: SSA	
C.	Law of Cosines	
D.	Vector Applications	
Complex Numbers and Polar Coordinates		6
A.	Operations with Complex Numbers	
B.	Trigonometric Form of a Complex Number	
C.	Product and Quotient Theorems	
D.	Powers and Roots of Complex Numbers	
Final Exam		2
	Total Lecture Hours	**48**

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. COMPETENCIES

A. ***Resources:*** *Identifies, organizes, plans, and allocates resources*
   1. follows a schedule to complete assigned tasks on time
   2. provide a self-evaluation of performance based on the time and quality of work and makes necessary adjustments

B. ***Interpersonal:*** *Works with others*
   1. encouraged to work in groups to more efficiently diagnose computational errors and sharing/reinforcing conceptual understanding of all mathematics
   2. works well with all members of the class from diverse cultural backgrounds

C. ***Information:*** *Acquires and uses information*
   1. encouraged to read the text, maintain a lecture notebook, and work math problems using the information acquired
   2. respond to instructor inquiries and questions on examinations
   3. communicates/interprets information by participating in classroom dialogue
   4. uses 050 computer tutorials as necessary
   5. uses scientific calculators and computer software to process information and perform calculations

D. ***Systems:*** *Understands complex inter-relationships*
   1. applies a systematic approach to solving mathematical problems
   2. develops an understanding of mathematical system complexity with applications to algebra, geometry, and trigonometric equation solving

E. ***Technology:*** *Works with a variety of technologies*
   1. selects appropriate calculator and tutorial software to meet the needs of the course
   2. selects appropriate methods to solve mathematical problems
   3. applies mathematical problem solving skills using a scientific calculator

II. FOUNDATION SKILLS

A. ***Basic Skills:*** *Reads, writes, performs arithmetic and mathematical operations, listens and speaks.*

   1. ***Reading:*** *Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
      a. interprets word problems, tables, graphs, and drawings of trigonometric functions to identify presented problem(s) and to determine period and amplitude functions
      b. reads and studies textbook, available tutorials, and video tapes
      c. uses available tutorials in the laboratory as needed
      d. follows a daily lecture schedule to maintain an appropriate time-line

   2. ***Writing:*** *Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
      a. communicates problem solving skills by solving mathematical problems in writing using presented information
      b. generates graphs from trigonometric equations
      c. completes all written assignments

3. ***Arithmetic/Mathematics:*** *Perform basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques*
    a. performs applied computations of arithmetic, algebra, geometry, and trigonometry
    b. solves equations and computes characteristics of and solves triangles
    b. selects appropriate formulae to solve specific mathematical problems
4. ***Listening:*** *Receives, attends to, interprets, and responds to verbal messages and other cues*
    a. assimilate classroom instruction
    b. interpret and assimilate video and tutorial instruction
    c. observe laboratory demonstrations
    d. seek and receive individualized instruction in the laboratory
    e. participates as an active listener in classroom instruction
5. ***Speaking:*** *Organizes ideas and communicates orally*
    a. participates in classroom discussions
    b. organize ideas and communicates specific questions to the instructor
    c. verbally affirms understanding of a concept, procedure, or required mathematical skill
    d. communicates with peers

B. ***Thinking Skills:*** *Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*
1. ***Creative Thinking:*** *Generates new ideas*
    a. develops new ideas for approaching problem solving
    b. participates in the "brain-storming" process
    c. participates in group problem solving process
    d. practices the team approach to problem solving
2. ***Decision Making:*** *Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
    a. identifies personal goals
    b. selects the correct procedure and formulae to solve mathematical problems
3. ***Problem Solving:*** *Recognizes problems and devises and implements plan of action*
    a. applies algebraic skills to solve problems
    b. makes daily accommodations to stay on schedule
    c. seeks additional instruction/clarification for assignment completion
    d. balances social and academic life/responsibilities
    e. accepts responsibility
4. ***Seeing Things In the Mind's Eye:*** *Organizes, and processes symbols, pictures, graphs, objects, and other information*
    a. prepares sketches, graphs, and tables to assist in understanding word problems
    b. interprets word problems
    c. assimilates arithmetic problems in class
    d. interprets non-verbal communication in the classroom

5. *Knowing How to Learn: Use efficient learning techniques to acquire and apply new knowledge and skills*
    a. recognizes relevant information to solve specific problem(s)
    b. identifies "given" data and applies appropriate equations
    c. demonstrates mastery of basic math skills
    d. uses sequential math skills to support mastery of new skills
    e. thinks through the problem mentally before selecting appropriate formula(e)/equation(s)
6. *Reasoning: Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
    a. understands that the ability to apply mathematics requires "practice"
    b. understands the necessity to perform math as applied to specific technology
    c. selects appropriate mathematical application after considering all given data

C. *Personal Qualities: Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*

1. *Responsibility: Exerts a high level of effort and perseveres towards goal attainment*
    a. develops an understanding that in order to be successful in mathematics, preparation for the day's work is necessary
    b. develops an understanding that classroom attendance is essential for success in the course
    c. accepts the responsibility for active participation in class
2. *Self-Esteem: Believes in own self-worth and maintains a positive view of self*
    a. learns to take pride in his or her work through positive reinforcement
    b. sees himself or herself as an asset to the class through continued contributions to the group and a shared common goal
    c. understands that an individual with a positive attitude and the belief in their own abilities will systematically seek solutions and be a valuable employee
    d. accepts shared common goals of the class and views each individual as an asset to the group
3. *Sociability: Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
    a. assist classmates in improving mathematical skills
    b. assist students with special needs as a peer mentor
    c. share laboratory resources
    d. assist classmates in understanding math applications in a group
4. *Self-Management: Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
    a. maintain a record of academic achievement (individual grade book)
    b. accept the responsibility for self-management
    c. set goals and complete assigned tasks
5. *Integrity/Honesty: Chooses ethical courses of action*
    a. accept the responsibility for own actions

b. exhibit personal honesty at all times

c. accept the challenge of doing your own work in the laboratory, during examination, and on outside assignments

d. understand the consequences of unethical behaviors

MATH 1316
01/080996

*M*achine Tool *A*dvanced *S*kills
*T*echnology Program

MAST

GENERAL EDUCATION
COURSE SYLLABUS

OCCUPATIONAL MATHEMATICS

MAST PROGRAM
COURSE SYLLABUS
OCCUPATIONAL MATHEMATICS

Lecture hours/week: 3 **Lab hours/week: 2** **Credit hours: 4**

COURSE DESCRIPTION:

This course includes basic English and Metric units of measurement, geometric principles, solution of basic algebraic equations, and solution of right triangles. Problems from specific occupational areas will be stressed.

PREREQUISITES: **As determined by the MATH placement test.**

REQUIRED COURSE MATERIALS:

Recommended Textbook: Mathematics for Machine Technology, Smith, R.D., Third Edition, Delmar Publishers Inc., 1984

Supplies:
#2 Pencils
Notebook
Calculator: any "Scientific" calculator

COURSE OBJECTIVES:

Upon completion of this course, the student will:

1. understand and use basic units of English and Metric systems of measurement, as well as converting from one type measurement to another;
2. perform basic algebraic operations;
3. evaluate formulae and manipulate formula for any variable;
4. recognize plane geometric shapes and some geometric applications to specific vocations; and
5. solve right triangle problems using basic trigonometry.

LECTURE OUTLINE:

Lecture Topics	Contact Hrs.
Introduction and Review	3
Linear Measurements	2
a. English Units	
b. Metric units	
c. Conversions	
Fundamentals of Algebra	6
a. Evaluation; Absolute Value	

b.	Signed Numbers:	
	Addition, Subtraction, Multiplication, Division	
c.	Laws of Exponents	
d.	Algebraic Expressions:	
	Addition, Subtraction, Multiplication, Division	
Equations and Formulae		6
a.	Solving Equations and Formulae	
b.	Ratio and Proportion	
c.	Writing Equations	
Geometric Shapes		5
a.	Points, Lines, Angles	
b.	Triangles	
c.	Other Polygons and Circles	
d.	Area and Volume Formula	
Trigonometry		9
a.	Definitions of Trigonometric Functions	
b.	Trigonometric Tables	
c.	Solution of Right Triangles	
d.	Applications	
TESTING		5
	Total Lecture Hours	**36**

LAB OUTLINE:

Lab Topics	**Contact Hrs.**
Rounding Decimals	3
Expressing Fractions as Decimals and Decimals as Fractions	
Review	
Conversions between English and Metric units of measure	1
Applications of Evaluating Algebraic Expressions	6
Signed Number Drills	
Laws of Exponents	
Scientific Notation	
Review of Algebraic Expression	
Solving Equations with Combined Operations	6
Rearranging Formulae	
Writing Equations	
Inverse Proportion	
Review of Equations and Formulae	
Angles: Minutes to Decimal parts and vice versa	6
Applications of Triangles and other Polygons	
Applications of Circles	
Area and Volume Formulae	
Interpolation	2
Applications of Right Triangles	
Total Lab Hours	**24**

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. COMPETENCIES

- *A.* ***Resources:** Identifies, organizes, plans, and allocates resources*
  1. follows a schedule to complete assigned tasks on time
  2. provide a self-evaluation of performance based on the time and quality of work
- *B.* ***Interpersonal:** Works with others*
  1. participates in classroom dialogue, contributing to group effort in problem solving
  2. works well with all members of the class.
- *C.* ***Information:** Acquires and uses information*
  1. apply mathematical solutions to problems assigned
  2. organize and maintain lecture notebook and assignment notebook
  3. communicates/interprets information by participating in classroom dialogue
  4. uses 050 computer tutorials as necessary
- *D.* ***Systems:** Understands complex inter-relationships*
  1. applies a systematic approach to solving mathematical problems
  2. develops an understanding of mathematical system complexity with applications to algebra, geometry, and trigonometric equation solving
- *E.* ***Technology:** Works with a variety of technologies*
  1. selects appropriate calculator to meet the needs of the course
  2. selects appropriate methods to solve mathematical problems
  3. selects appropriate measurement procedures
  4. applies mathematical problem solving skills using a scientific calculator

II. FOUNDATION SKILLS

- *A.* ***Basic Skills:*** Reads, writes, performs arithmetic and mathematical operations, listens and speaks.
  1. ***Reading:** Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
     - a. interprets word problems, tables, graphs, and drawings to identify presented problem(s)
     - b. reads and studies textbook, available tutorials, and video tapes
     - c. uses available tutorials in the laboratory as needed

2. *Writing: Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
    a. communicates problem solving skills by solving mathematical problems in writing using presented information
    b. maintains a lecture notebook
    c. completes all written assignments
3. *Arithmetic/Mathematics: Perform basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques*
    a. performs applied computations of arithmetic, algebra, geometry, and trigonometry
    b. performs applied computations of measurement conversions
4. *Listening: Receives, attends to, interprets, and responds to verbal messages and other cues*
    a. assimilate classroom instruction
    b. interpret and assimilate video instruction
    c. observe laboratory demonstrations
    d. seek and receive individualized instruction in the laboratory
    e. participates as an active listener in classroom instruction
5. *Speaking: Organizes ideas and communicates orally*
    a. participates in classroom discussions
    b. organize ideas and communicates specific questions to the instructor
    c. verbally affirms understanding of a concept, procedure, or required mathematical skill
    d. communicates with peers

B. *Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*

1. *Creative Thinking: Generates new ideas*
    a. develops new ideas for approaching problem solving
    b. participates in the "brain-storming" process
    c. participates in group problem solving process
    d. practices the team approach to problem solving
2. *Decision Making: Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
    a. identifies personal goals
    b. selects specific math applications
3. *Problem Solving: Recognizes problems and devises and implements plan of action*
    a. makes daily accommodations to stay on schedule
    b. seeks additional instruction/clarification for assignment completion
    c. balances social and academic life/responsibilities
    d. accepts responsibility
4. *Seeing Things In the Mind's Eye: Organizes, and processes symbols, pictures, graphs, objects, and other information*
    a. prepares sketches, graphs, and tables to assist in understanding word problems

   - b. interprets word problems
   - c. assimilates arithmetic problems in class
   - d. interprets non-verbal communication in the classroom

5. ***Knowing How to Learn:*** *Use efficient learning techniques to acquire and apply new knowledge and skills*
   - a. recognizes relevant information to solve specific problem(s)
   - b. identifies "given" data and applies appropriate equations
   - c. demonstrates mastery of basic math skills
   - d. uses sequential math skills to support mastery of new skills
   - e. thinks through the problem mentally before selecting appropriate formula(e)/equation(s)

6. ***Reasoning:*** *Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
   - a. understands that the ability to apply mathematics requires "practice"
   - b. understands the necessity to perform math as applied to specific technology
   - c. selects appropriate mathematical application after considering all given data

C. ***Personal Qualities:*** *Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*

1. ***Responsibility:*** *Exerts a high level of effort and perseveres towards goal attainment*
   - a. develops an understanding that in order to be successful in mathematics, preparation for the day's work is necessary
   - b. develops an understanding that classroom attendance is essential for success in the course
   - c. accepts the responsibility for active participation in class

2. ***Self-Esteem:*** *Believes in own self-worth and maintains a positive view of self*
   - a. learns to take pride in his or her work through positive reinforcement
   - b. sees himself or herself as an asset to the class through continued contributions to the group and a shared common goal
   - c. understands that an individual with a positive attitude and the belief in their own abilities will systematically seek solutions and be a valuable employee
   - d. accepts shared common goals of the class and views each individual as an asset to the group

3. ***Sociability:*** *Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
   - a. assist classmates in improving mathematical skills
   - b. assist students with special needs as a peer mentor
   - c. share laboratory resources
   - d. assist classmates in understanding math applications in a group

4. ***Self-Management:*** *Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
   - a. maintain a record of academic achievement (individual grade book)

b. accept the responsibility for self-management
c. set goals and complete assigned tasks

5. *Integrity/Honesty: Chooses ethical courses of action*
    a. accept the responsibility for own actions
    b. exhibit personal honesty at all times
    c. accept the challenge of doing your own work in the laboratory, during examination, and on outside assignments
    d. understand the consequences of unethical behaviors

MTH 115
01/080896

*M*achine Tool *A*dvanced *S*kills
*T*echnology Program

MAST

GENERAL EDUCATION
COURSE SYLLABUS

ELEMENTARY PHYSICS

MAST PROGRAM
COURSE SYLLABUS
ELEMENTARY PHYSICS

Lecture hours/week: 4 **Lab hours/week: 0** **Credit hours: 3**

COURSE DESCRIPTION:

An algebra-level, problem solving course. Presents special topics of measurements and the classical physics of mechanics, energy, and motion with emphasis on fundamental concepts, problem solving, notation and units.

PREREQUISITE: **Intermediate Algebra or above**

REQUIRED COURSE MATERIALS:

Recommended Textbook:	Fundamentals of College Physics, Nolan, Peter, J., W.C. Brown Publishers, 2nd ed., 1995, ISBN # 0-697-29571-0
Supplies:	Scientific Calculator Notebook paper Metric ruler Protractor (1 degree increments) Graph paper Pencils

COURSE OBJECTIVES:

Upon completion of this course, the student will be able to:

1. demonstrate comprehension of ideas and concepts of physics of mechanics, energy, and motion;
2. demonstrate the use of prerequisite mathematical skills and application of concepts in problem solving;
3. apply problem solving techniques and quantitatively solve physics problems in topics of mechanics, energy;
4. evaluate the assumptions and results of an analytically solved problem in terms of realistic expectations of experimental agreement.

LECTURE OUTLINE:

Lecture Topics	Contact Hrs.
Technical Mathematics and Measurement	4
A. Systems of Units and Measure	

B.	Conversion of units and physical dimensions	
C.	Significant figures and Scientific Notation	
D.	Coordinate systems and Geometry review	
Forces and Vectors		6
A.	Vector and scaler quantities	
B.	Addition of vectors and resultant force	
C.	Right Triangles and Sine, Cosine, and Tangent ratios	
D.	Vector components and component addition	
Equilibrium and Friction		6
A.	Newton's First and Third Laws of Motion	
B.	Free-Body Diagrams	
C.	Equilibrium of concurrent force systems	
D.	Equilibrium and vector components	
E.	Friction and Normal Force	
Torque and Rotational Equilibrium		5
A.	Moment Arms	
B.	Torque due to a force	
C.	Resultant Torque and Rotational Equilibrium	
D.	Center of Gravity	
Uniformly Accelerated Motion		5
A.	Speed and Velocity	
B.	Accelerated Motion	
C.	Linear Equations and Motion	
D.	Solution of accelerated problems	
E.	Gravity and freely falling bodies	
Force and Acceleration		5
A.	Newton's Second law of Motion	
B.	Relationship between Weight and Mass	
C.	Application of newton's Second Law to Single Body Problems	
D.	Problem Solving Techniques	
Energy and Momentum		6
A.	Work and Resultant Work	
B.	Work and Kinetic Energy	
C.	Potential Energy	
D.	Conservation of Energy	
E.	Power	
F.	Impulse and Momentum	
G.	Law of Conservation of Momentum	
Rotational Motion		3
A.	Motion in a Circular Path	
B.	Centripetal Acceleration	
C.	Centripetal Force	
D.	Friction and the Centripetal Force	
Exams and Review		8
	Total Lecture Hours	**48**

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. **COMPETENCIES**
   - A. ***Resources:*** *Identifies, organizes, plans, and allocates resources*
     1. follows a schedule to complete assigned tasks on time
     2. uses feedback to assess progress in class
     3. uses peer/instructor resources to reach identified goals
     4. assesses personal strength and areas of improvement and develops appropriate career goals
   - B. ***Interpersonal:*** *Works with others*
     1. works with peers through informal study groups to accomplish assigned tasks
     2. works well with individuals from a variety of ethnic, social, gender, and educational backgrounds to complete assigned tasks
   - C. ***Information:*** *Acquires and uses information*
     1. engages in physics problem solving activities
     2. uses critical thinking skill in evaluating physics problems
     3. selects and analyzes information and communicates the results to others using written and graphic methods

II. **FOUNDATION SKILLS**
   - A. ***Basic Skills:*** *Reads, writes, performs arithmetic and mathematical operations, listens and speaks.*
     1. ***Reading:*** *Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
        - a. reads and studies textbook
        - b. completes reading assignments
        - c. interprets reading assignments and physics problems
        - d. interprets/follows class schedule
     2. ***Writing:*** *Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
        - a. maintains a lecture notebook
        - b. submits written responses to chapter question assignments
     3. ***Arithmetic/Mathematics:*** *Perform basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques*

   - a. applies problem solving techniques to quantitatively solve physics problems in topics of mechanics and energy
   - b. evaluates the assumptions and results of an analytically solved problem in terms of realistic expectations of experimental agreement.

4. *Listening: Receives, attends to, interprets, and responds to verbal messages and other cues*
   - a. receives/interprets verbal messages via didactic presentations
   - b. responds to verbal messages
   - c. confirms verbal message interpretations both in and out of class
   - d. makes appropriate behavior responses to verbal messages

5. *Speaking: Organizes ideas and communicates orally*
   - a. participates in classroom discussions
   - b. organize ideas and communicates specific questions to the instructor
   - c. verbally affirms understanding of a concept, procedure, or required skill
   - d. communicates effectively with peers

B. *Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*

1. *Creative Thinking: Generates new ideas*
   - a. develops new ideas for approaching problem solving
   - b. participates in the brainstorming process
   - c. participates in group problem solving

2. *Decision Making: Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
   - a. identifies actions required to accomplish personal goals

3. *Problem Solving: Recognizes problems and devises and implements plan of action*
   - a. makes daily accommodations to stay on schedule
   - b. seeks additional instruction/clarification for assignment completion
   - c. accepts responsibility

4. *Seeing Things In the Mind's Eye: Organizes, and processes symbols, pictures, graphs, objects, and other information*
   - a. visually, using symbols, graphs, and pictures, describes physics problems presented
   - b. uses the problem solving process to identify given data and unknown data
   - c. selects appropriate problem solving strategies including appropriate math formulae

5. *Knowing How to Learn: Use efficient learning techniques to acquire and apply new knowledge and skills*
   - a. uses techniques for creative thinking
   - b. develops strategies for problem solving

6. *Reasoning: Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
   - a. performs critical thinking when solving physics problems

C. *Personal Qualities: Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*

1. ***Responsibility:*** *Exerts a high level of effort and perseveres towards goal attainment*
    - a. accepts responsibility for behavior and develops a proactive attitude
2. ***Self-Esteem:*** *Believes in own self-worth and maintains a positive view of self*
    - a. provided with positive feedback and encouragement
    - b. provided with individual mentoring and counseling
3. ***Self-Management:*** *Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
    - a. performs personal goal setting activities
    - b. assesses self and personal goals and monitors individual progress
4. ***Integrity/Honesty:*** *Chooses ethical courses of action*
    - a. accepts the responsibility for own actions
    - b. meets specific criteria standards to successfully complete the course
    - c. demonstrates honesty and integrity
    - d. encouraged to accept ethical and honest course of action set by example

*M*achine Tool *A*dvanced *S*kills
*T*echnology Program

MAST

GENERAL EDUCATION
COURSE SYLLABUS

HUMAN RELATIONS

MAST PROGRAM
COURSE SYLLABUS
HUMAN RELATIONS

Lecture hours/week: 2 **Lab hours/week: 2** **Credit hours: 3**

COURSE DESCRIPTION:

A human relations course that deals with the dynamics involved in developing and maintaining positive/productive interpersonal and work relationships. Experiential group exercises give students an opportunity to immediately apply and practice the learned skills.

PREREQUISITES: **NONE**

REQUIRED COURSE MATERIALS:

Recommended Textbook:	Human Relations, Dalton, M., Hoyle, D.G., Watts, M.W., South Western Pub. Co., 1992
Supplies:	Scantron Answer Sheets Chatsworth Cards (Dr. Doody Only) 2 pencils (#2)

COURSE OBJECTIVES:

Upon completion of the course, the student will:

1. Demonstrate an understanding of the factors that help and hinder effective interactions in their work and personal environments;
2. Demonstrate knowledge of the skills necessary for a cooperative work environment that facilitates the attainment of personal and organizational goals;
3. Demonstrate the skills necessary to cope with the complex ever-changing work and social environments; and
4. Demonstrate an increased understanding of the behaviors that will help them become successful in predicting, understanding, and influencing the outcome of their interactions with others.

LECTURE OUTLINE

Lecture Topics	Text Reference Page	Contact Hrs.
Course Orientation; Introduction to Human Relations	Chapter 1	2
Psychology of People		4
Perception	Chapter 2	
Communication	Chapter 3	

Group Dynamics	Chapter 4	
Putting Human Resources to Work		6
Organizational Structure	Chapter 5	
Motivation	Chapter 6	
Goal Setting and Job Performance	Chapter 7	
Change Dynamics	Chapter 8	
Power, Decision Making and the Group		4
Power	Chapter 10	
Problem Solving, Decision Making and Creativity	Chapter 11	
Team-building	Chapter 12	
Laws and Ethics		4
Employee Rights	Chapter 13	
Substance Abuse	Chapter 15	
Ethics	Chapter 16	
Your Growth and Future		4
Business Etiquette	Chapter 17	
Wellness	Chapter 19	
Transition to the Future	Chapter 20	
	Total Lecture Hours	**24**

LAB OUTLINE:

Lab Topics		**Contact Hrs.**
Psychology of People		4
Putting Human Resources to Work		4
Power, Decision Making and the Group		4
Laws and Ethics		4
Your Growth and Future		4
Exams		4
	Total Lab Hours	**24**

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. COMPETENCIES

- A. ***Resources:*** *Identifies, organizes, plans, and allocates resources*
  - 1. follows a schedule to complete assigned tasks on time
  - 2. assesses personal strengths and weaknesses and develops appropriate career goals
- B. ***Interpersonal:*** ***Works with others.***
  - 1. works cooperatively with others and contributes to the group process with ideas, suggestions and effort
  - 2. provides feedback to peers and instructors
  - 3. demonstrates good human relation skills in interpersonal interactions
  - 4. communicates thoughts, feelings, and ideas, and when appropriate, responsibly challenges existing procedures, policies, or authority
  - 5. uses authority appropriately
  - 6. resolves conflict
  - 7. works well with individuals from a variety of ethnic, social and educational backgrounds in completing assigned tasks
- C. ***Information:*** ***Acquires and uses information***
  - 1. solves problems
  - 2. uses critical thinking skills in making decisions
  - 3. selects and analyzes information and communicates the results to others using oral, written, graphics, pictorial, or multimedia methods
- D. ***Systems:*** *Understands complex inter-relationships*
  - 1. demonstrates knowledge of organizational structure and uses the chain of command

II. FOUNDATION SKILLS

- A. ***Basic Skills:*** *Reads, writes, performs arithmetic and mathematical operations, listens and speaks.*
  - *1.* ***Reading:*** *Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
    - a. reads and studies textbook
    - b. completes reading assignments
    - c. interprets reading assignments
    - d. interprets/follows class schedule
  - *2.* ***Writing:*** ***Communicates thoughts, ideas, information, and messages in writing; and creates documents, such as letters, directions, manuals, and flow charts***
    - a. completes written assignments
    - b. takes class notes
  - *3.* ***Listening:*** *Receives, attends to, interprets, and responds to verbal messages and other cues*
    - a. receives/interprets verbal messages via didactic presentations
    - b. responds to verbal messages
    - c. confirms verbal message interpretations both in and out of class
    - d. makes appropriate behavior response to verbal messages

  - 4. ***Speaking:*** *Organizes ideas and communicates orally*
    - a. participates in classroom discussions
    - b. organizes ideas and communicates specific questions to the instructor
    - c. verbally affirms understanding of a concept, procedure, or required skill
    - d. communicates effectively with peers
- B. ***Thinking Skills:*** *Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*
  - 1. ***Creative Thinking:*** *Generates new ideas*
    - a. develops new ideas for approaching problem solving
    - b. participates in the brainstorming process
    - c. participates in group problem solving
    - d. practices the team approach to problem solving
  - 2. ***Decision Making:*** *Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
    - a. generates a personal and career development plan
    - b. assesses personal growth and development areas
    - c. generates a list of career alternatives and chooses the most appropriate career choices based upon personal attributes
    - d. identifies actions required to accomplish personal goals
  - 3. ***Problem Solving:*** *Recognizes problems and devises and implements plan of action*
    - a. makes daily accommodations to stay on schedule
    - b. seeks additional instruction/clarification for assignment completion
    - c. balances social and academic life/responsibilities
    - d. accepts responsibility
    - e. demonstrates a creative solution to a problem in writing
  - 4. ***Seeing Things In the Mind's Eye:*** *Organizes and processes symbols, pictures, graphs, objects, and other information*
    - a. participates in activities that encourage accepting responsibility for her/his career success
    - b. participates in activities to strengthen belief in self-worth and encourage proactive/responsible choices
  - 5. ***Knowing How to Learn:*** *Use efficient learning techniques to acquire and apply new knowledge and skills*
    - a. develops techniques for adapting learning style for differences in teaching styles
    - b. utilizes techniques for creative thinking
    - c. develops strategies for problem solving
  - 6. ***Reasoning:*** *Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
    - a. performs self analysis of effective learning styles
    - b. develops techniques for adapting learning style for differences in teaching styles
    - c. performs critical thinking
    - d. develops effective memory techniques

C. ***Personal Qualities:*** *Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*

1. ***Responsibility:*** *Exerts a high level of effort and perseveres towards goal attainment*
    a. develops stress management techniques that facilitate and encourage goal attainment
    b. accepts responsibility for behavior and develops a proactive attitude turning individual strengths into academic assets
2. ***Self-Esteem:*** *Believes in own self-worth and maintains a positive view of self*
    a. provided positive feedback/encouragement
    b. provided individual mentoring/counseling to support the educational process
    c. encouraged to develop interpersonal skills that will allow him/her to interact with confidence and project a positive self-image
    d. encouraged to practice positive peer feedback during daily exchange, in rotating diads; this activity is processed by the entire class and feelings are explored every class meeting
3. ***Sociability:*** *Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
    a. participates in discussions of cultural diversity and its benefits
    b. discusses and demonstrates strategies for effective communication across cultures
    c. participates in discussions of gender diversity and sexism
    d. participates in discussions of different learning styles and disabilities
    e. encouraged to adopt an attitude of tolerance
4. ***Self-Management:*** *Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
    a. assess self/personal goals and monitors individual progress
    b. performs goal setting activities
    c. conducts self assessment of performance on quizzes
5. ***Integrity/Honesty:*** *Chooses ethical courses of action*
    a. meets specific criteria standards to successfully complete the course
    b. demonstrates honesty and integrity while grading quizzes
    c. encouraged to accept ethical and honest courses of action by example
    d. situations and group activities provide opportunities to explore and formulate professional and personal ethical standards

*M*achine Tool *A*dvanced *S*kills
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MAST

GENERAL EDUCATION
COURSE SYLLABUS

COLLEGE SUCCESS SKILLS

MAST PROGRAM
COURSE SYLLABUS
COLLEGE SUCCESS SKILLS

Lecture hours/week: 1 **Lab hours/week: 0** **Credit hours: 1**

COURSE DESCRIPTION:

This course is designed to provide students with the skills and knowledge to be successful in college. Topics include: diversity; self-management; tests taking; memory skills; reading techniques; critical thinking skills; and managing issues that face many college students.

PREREQUISITES: **NONE**

REQUIRED COURSE MATERIALS:

Recommended Textbook: Becoming a Master Student, 7th. Ed., Ellis, D., Houghton Mifflin Company, 1994

Supplies:
2 pencils (#2)
3 Ring Binder
Pen

COURSE OBJECTIVES:

Upon completion of the course, the student will be able to:

1. understand how he/she is responsible for his/her own experience in college;
2. describe ways to create a successful and satisfying college experience;
3. describe methods to:
    a. improve ability to recall information;
    b. manage time more effectively;
    c. read a textbook with improved retention;
    d. take effective notes;
    e. prepare for and take tests;
    f. listen to a lecture for comprehension and;
    g. apply creative and critical thinking skills.
4. examine personal ideas and decisions regarding issues typically faced by college students.

COURSE OUTLINE

Topics	Text Reference Page	Contact Hrs.
What Am I Doing Here? Who Are All These People And Where Did They Come From?		3

First Step	Chapter 1	
Diversity	Chapter 2	
I Need a 27-hour Day! Why Is this String Around My Finger?		3
Time/Self Management	Chapter 3	
Memory	Chapter 4	
I Have to Read The Whole Book by Next Week? That Professor Talks All the Time And I Can't Keep Up.		3
Power reading	Chapter 5	
Note Taking	Chapter 6	
I've Got 4 Tests This Week! Aha!		3
Skills for Taking Tests	Chapter 7	
Critical Thinking Skills	Chapter 8	
	Total Lecture Hours	**12**

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. **COMPETENCIES**
  A. ***Resources:*** *Identifies, organizes, plans, and allocates resources*
    1. follows a schedule to complete assigned tasks on time
    2. determine the initial cost of educational expenses and locates appropriate funding sources
    3. monitors and budgets the flow of money and uses strategies for increasing income and decreasing expenses
    4. assesses personal strengths and weaknesses and develops appropriate career goals
  B. ***Interpersonal:*** *Works with others*
    1. functions as a member of the team in completing assignments
    2. provides feedback to peers as requested
    3. demonstrates good human relation skills and interpersonal interactions
    4. communicates thoughts, feelings and ideas when appropriate; and responsibly challenges existing procedures, policies or authority
    5. resolve conflict
    6. works well with individuals from a variety of ethnic, social or educational backgrounds in completing assigned tasks

C. *Information: Acquires and uses information*
  1. engages in problem solving activities
  2. uses a variety of memory techniques to recall information
  3. uses critical thinking skill in making decisions

D. *Systems: Understands complex inter-relationships*
  1. demonstrate knowledge of organizational structure and follows the chain of command

II. FOUNDATION SKILLS

A. *Basic Skills: Reads, writes, performs arithmetic and mathematical operations, listens and speaks.*
  1. *Reading: Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
    a. reads and studies textbook
    b. completes reading assignments
    c. interprets reading assignments as demonstrated in classroom dialogue
    d. interprets and follows class schedule
  2. *Writing: Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
    a. completes written assignments and quizzes
    b. creates an individually designed note-taking system
    c. takes class notes
  3. *Arithmetic/Mathematics: Perform basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques*
    a. completes a time-monitor plan
  4. *Listening: Receives, attends to, interprets, and responds to verbal messages and other cues*
    a. receives/interprets verbal messages via didactic presentations
    b. responds to verbal messages
    c. confirms verbal message interpretations both in and out of class
    d. makes appropriate behavioral response to verbal messages
  5. *Speaking: Organizes ideas and communicates orally*
    a. participates in classroom discussions
    b. organize ideas and communicates specific questions to the instructor
    c. verbally affirms understanding of a concept, procedure, or required skill
    d. communicates with peers

B. *Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*
  1. *Creative Thinking: Generates new ideas*
    a. develops new ideas for approaching problem solving
    b. participates in the brainstorming process
    c. participates in group problem solving
    d. practices the team approach to problem solving

2. ***Decision Making:** Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
    a. generates a personal and career development plan
    b. assesses areas for personal growth and develops a personal growth plan
    c. generates a list of career alternatives and chooses the most appropriate career choices based upon a list of personal attributes
    d. identifies actions required to accomplish personal goals
3. ***Problem Solving:** Recognizes problems and devises and implements plan of action*
    a. learns the steps to problem solving
    b. participates in group and individual problem solving processes
    c. makes daily accommodations to stay on schedule
    d. seeks additional instruction/clarification for assignment completion
    e. balances social and academic life responsibilities
    f. accepts responsibility
    g. demonstrates creative solutions to problems
4. ***Seeing Things In the Mind's Eye:** Organizes, and processes symbols, pictures, graphs, objects, and other information*
    a. participates in activities that encourage accepting responsibility for his/her career success
    b. participate in activities to strengthen belief in self-worth and encourage proactive/responsible choices
5. ***Knowing How to Learn:** Use efficient learning techniques to acquire and apply new knowledge and skills*
    a. utilize techniques for adapting learning styles to differences in teaching styles
    b. performs assessment of individual learning style
    c. practices memory techniques
    d. practices reading improvement techniques
    e. utilizes techniques for creative thinking
    f. develops strategies for effective problem solving
6. ***Reasoning:** Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
    a. performs self analysis of effective learning styles
    b. utilizes techniques for effective creative thinking
    c. develops strategies for effective problem solving

C. ***Personal Qualities:** Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*

1. ***Responsibility:** Exerts a high level of effort and perseveres towards goal attainment*
    a. utilizes stress management techniques that facilitate goal attainment
    b. accepts responsibility and develops a proactive attitude, turning individual strengths into academic assets
2. ***Self-Esteem:** Believes in own self-worth and maintains a positive view of self*
    a. provides positive feedback/encouragement in groups

b. provides individual mentoring/counseling to support the educational process
c. encouraged to develop interpersonal skills that will allow him/her to interact with confidence and project a positive self-image
d. encouraged to practice positive peer feedback during daily exchanges

3. *Sociability: Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
   a. participates in discussions of cultural diversity and its benefits
   b. discusses and demonstrates strategies for effective communication across cultures
   c. participates in discussions of gender diversity and sexism
   d. participates in discussions of different learning styles and disabilities
   e. encouraged to adopt an attitude of tolerance
4. *Self-Management: Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
   a. assesses self/personal goals and monitors individual progress
   b. performs goal setting activities
   c. conducts self-assessment on quizzes
5. *Integrity/Honesty: Chooses ethical courses of action*
   a. meets specific criteria standards to successfully complete the course
   b. demonstrate honesty and integrity while grading quizzes
   c. encouraged to accept ethical and honest course of action by example
   d. situations and group activities provide opportunity to explore and formulate professional and personal ethical standards

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MAST

GENERAL EDUCATION
COURSE SYLLABUS

GENERAL PSYCHOLOGY

MAST PROGRAM
COURSE SYLLABUS
GENERAL PSYCHOLOGY

Lecture hours/week: 4 **Lab hours/week: 0** **Credit hours: 3**

COURSE DESCRIPTION:

A survey of the major topics in psychology, introducing the study of behavior and the factors that determine and affect behavior.

PREREQUISITES: **NONE**

REQUIRED COURSE MATERIALS:

Recommended Textbooks:	Exploring Psychology, (Latest Edition), New York, New York: Worth Publishers, 1993 Psychology In Action, (Latest Edition), New York, New York: John Wiley and Sons, 1993
Supplies:	Scantron Answer Sheets

COURSE OBJECTIVES:

Upon completion of this course, the student will be able to:

1. Differentiate between the popular image of psychology and the more accurate picture of the nature and content areas of psychology;
2. Recognize the major concepts, vocabulary, theories, research findings and principles of psychology;
3. Demonstrate application of the basic principles of psychological theory to real-life situations;
4. Have increased his/her understanding of similarities and differences among the people of the world as they relate to psychological principles, concepts, and issues;
5. Integrate overall knowledge of psychology by analyzing, synthesizing, and evaluating his/her own behavior to determine how well he/she is using and will continue to use the information acquired in this course to:
   a. make a more effective personal-social adjustment to his/her environment;
   b. develop a more open-minded attitude about human behavior; and
   c. become more tolerant of his/her own and others' behavior by understanding some of its determinants.

LECTURE OUTLINE:

Lecture Topics	Text Reference Page	Contact Hrs.
Introduction to General Psychology		4

Course Orientation		
Introduction to Psychology	Chapter 1	
Biological Roots of Behavior		8
Biological Roots of Behavior	Chapter 2	
The Developing Person	Chapter 3	
Sensation, Perception, and Consciousness		8
Sensation and Perception	Chapter 4	
States of Consciousness	Chapter 5	
Learning, Memory, and Intelligence		8
Learning	Chapter 6	
Memory	Chapter 7	
Thinking and Intelligence	Chapter 8	
Motivation, Emotions, Stress and Health		8
Motivation	Chapter 9	
Emotions, Stress, and Health	Chapter 10	
Personality and Psychological Disorders		8
Personality	Chapter 11	
Psychological Disorders	Chapter 12	
Social Basis of Behavior		4
Social Diversity	Chapter 15	
Course Wrap-Up		—
	Total Lecture Hours	**48**

COURSE OBJECTIVES: SCANS COMPETENCIES

The Secretary's Commission on Achieving Necessary Skills (SCANS), U.S. Department of Labor, has identified in its "AMERICA 2000 REPORT" that all students should develop a new set of competencies and foundation skills if they are to enjoy a productive, full and satisfying life. These are in addition to the Technical Workplace Competencies required by industry. SCANS is made up of five competencies and a three-part foundation of skills and personal qualities that are needed for solid job performance.

The following activities will be performed by each student for successful completion of this course:

I. COMPETENCIES

A. *Resources: Identifies, organizes, plans, and allocates resources*
   1. follows a schedule to complete assigned tasks on time
   2. uses feedback to assess progress in course
   3. uses peer/instructor resources to reach identified goals
   4. assesses personal strength and areas of improvement and develops appropriate career goals

B. *Interpersonal: Works with others*
   1. works with peers in groups to accomplish instructional goals/objectives
   2. teaches instructional objectives assigned by instructor
   3. provides feedback to peers and instructor
   4. demonstrates good human relations skills in interpersonal interactions

        5. communicates thoughts, feelings, and ideas and when appropriate, responsibly challenges existing procedures, policies, or authority
        6. resolves conflict
        7. works well with individuals from a variety of ethnic, social, and educational backgrounds in completing assigned tasks
    C. *Information: Acquires and uses information*
        1. engages in problem solving activities
        2. uses critical thinking skills in evaluating issues related to psychology
        3. selects and analyzes information and communicates the results to others using oral, written, graphic, pictorial, or multimedia methods
        4. uses computers to complete lab assignments on assigned topics
    D. *Systems: Understands complex inter-relationships*
        1. demonstrates knowledge of organizational structure and uses the chain of command

II. **FOUNDATION SKILLS**
    A. *Basic Skills: Reads, writes, performs arithmetic and mathematical operations, listens and speaks.*
        1. ***Reading:*** *Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules*
            a. reads and studies textbook
            b. completes reading assignments
            c. interprets reading assignments as demonstrated in classroom dialogue
            d. interprets/follows class schedule
        2. ***Writing:*** *Communicates thoughts, ideas, information, and messages in writing; and creates documents such as letters, directions, manuals, reports, graphs, and flow charts*
            a. completes written assignments and quizzes
            b. takes class notes
        3. ***Listening:*** *Receives, attends to, interprets, and responds to verbal messages and other cues*
            a. receives/interprets verbal messages via didactic presentations
            b. responds to verbal messages
            c. confirms verbal message interpretations both in and out of class
            d. makes appropriate behavior response to verbal message
        4. ***Speaking:*** *Organizes ideas and communicates orally*
            a. participates in classroom discussions
            b. organizes ideas and communicates specific questions to the instructor
            c. verbally affirms understanding of a concept, procedure, or required skill
            d. communicates effectively with peers
    B. *Thinking Skills: Thinks creatively, makes decisions, solves problems, visualizes, knows how to learn and reasons.*
        1. ***Creative Thinking:*** *Generates new ideas*
            a. develops new ideas for approaching problem solving
            b. participates in the brainstorming process
            c. participates in group problem solving

        - d. practices the team approach to problem solving
    - 2. ***Decision Making:*** *Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative*
        - a. generates a personal and career development plan
        - b. assess personal growth and development areas
        - c. identifies actions required to accomplish personal goals
    - 3. ***Problem Solving:*** *Recognizes problems and devises and implements plan of action*
        - a. makes daily accommodations to stay on schedule
        - b. seeks additional instruction/clarification for assignment completion
        - c. balances social and academic life/responsibilities
        - d. accepts responsibility
        - e. demonstrates a creative solution to a problem in writing
        - f. participates in group and individual problem solving process and learns the steps of problem solving
    - 4. ***Seeing Things In the Mind's Eye:*** *Organizes, and processes symbols, pictures, graphs, objects, and other information*
        - a. participates in activities that encourage accepting responsibility for her/his career success
        - b. participates in activities to strengthen belief in self-worth and encourage proactive/responsible choices
    - 5. ***Knowing How to Learn:*** *Use efficient learning techniques to acquire and apply new knowledge and skills*
        - a. develops techniques for adapting learning style for differences in teaching styles
        - b. utilizes techniques for creative thinking
        - c. develops strategies for problem solving
    - 6. ***Reasoning:*** *Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem*
        - a. performs self analysis of effective learning styles
        - b. develops techniques for adapting learning style differences in teaching styles
        - c. performs critical thinking
- *C.* ***Personal Qualities:*** *Displays responsibility, self-esteem, sociability, self-management, and integrity and honesty.*
    - 1. ***Responsibility:*** *Exerts a high level of effort and perseveres towards goal attainment*
        - a. utilizes stress management techniques that facilitate and encourage goal attainment
        - b. accepts responsibility for behavior and develops a proactive attitude
    - 2. ***Self-Esteem:*** *Believes in own self-worth and maintains a positive view of self*
        - a. provide positive feedback/encouragement
        - b. provide individual mentoring/counseling to support the educational process
        - c. encourage to develop interpersonal skills that will allow him/her to interact with confidence and project a positive self-image

    - d. encourage to practice positive peer feedback during daily exchange, in rotating diads; this activity is processed by the entire class and feeling s are explored every class meeting

3. *Sociability: Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings*
    - a. participates in discussions of cultural diversity and its benefits
    - b. discusses and demonstrates strategies for effective communication across cultures
    - c. participates in discussions of gender diversity and sexism
    - d. participates in discussions of different learning styles and disabilities
    - e. encourage to adopt an attitude of tolerance
4. *Self-Management: Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control*
    - a. assesses self/personal goals and monitors individual progress
    - b. performs goal setting activities
    - c. conducts self assessment of performance on quizzes
5. *Integrity/Honesty: Chooses ethical courses of action*
    - a. meets specific criteria standards to successfully complete the course
    - b. demonstrates honesty and integrity while grading quizzes
    - c. encourage to accept ethical and honest course action by example
    - d. situations and group activities provide opportunities to explore and formulate professional and personal ethical standards

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MAST

REMOTE SITE/INDUSTRIAL TRAINING MODEL

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MAST REMOTE SITE/INDUSTRIAL TRAINING MODEL

INTRODUCTION

The key to training and educating a quality workforce is for colleges to partner with industry and provide training which is actually required for the workforce. Some colleges have been guilty of teaching only what the professor already knows rather than what industry says that it needs.

Colleges should use every opportunity and every tool at their disposal to cultivate partnerships with industry. Colleges should make every effort to provide training to industry in a form that industry can use.

The MAST project has developed a series of Technical Training Modules in fifteen metals-related occupations. The MAST Consortium spent many months interviewing "expert" workers and developing Competency Profiles which were based on the actual skills standards which were identified by industry. These duties and tasks have been validated through a Texas survey of over 300 companies and a National survey of over 3000 companies. These technical modules are available to be used by colleges to offer industrial or remote site training to companies. These modules are generic in nature and modular in format. This means that they can be easily "customized" by the trainer to fit many training situations. The modules can also be combined in many ways to provide industry with a catalog of training materials so that each company can select exactly the training modules which they need.

The Remote Site/Industrial Training Model offers guidelines for marketing and conducting remote site (industrial) training. The model contains documentation for all phases of industrial training from the original industry contact through completion of the course.

MAST hopes that the delivery of these materials in this volume will provide incentive for colleges and technical schools to begin knocking on the doors of industry and trying to create and foster the partnerships which are essential today. Only through these partnerships will America continue to have a qualified workforce.

This Remote Site/Industrial Training Model serves as a portion of the MAST deliverables and as a guide for marketing industrial training. This model was produced by MAST and any opinions, findings, and conclusions or recommendations expressed in this material are those of the MAST Consortium and do not necessarily reflect the views of the U. S. Department of Education. MAST has defined remote site training as being non-credit (for non-matriculating students) type courses that could be offered, either on-campus or off-campus for Continuing Education Units (CEUs). The following types of training would fall into this category: continuing education, industrial training, and adult learning.

MAST started with industry competency profiles based upon personal interviews with expert workers. These technical workplace competencies were validated by the faculty and then both state and national survey results were incorporated into courses and the curriculum. At the same time the Secretary of Labor's Commission on Achieving Necessary Skills (SCANS) was infused into the courses syllabi. The curriculum was pilot tested, syllabi were loaded onto the Internet and packaged for delivery.

Part 1 - INDUSTRIAL TRAINING DEVELOPMENT PROCESS

This Remote Site/Industrial Training Model includes an eleven-step Industrial Training Development Process. Some industries will have a complete training department with a cadre of instructors and support staffs. Others may have only one person assigned to a training department. College training development personnel must understand what takes place in the industrial setting when an industry is considering developing a training program. The following is a typical step-by-step process for developing training for industry.

Eleven-Step Industrial Training Development Process

1. Identify the training needs
2. Obtain management endorsement
3. Develop a training implementation plan
4. Develop training materials
5. Devise a training measurement follow-up plan
6. Select the best trainer for the course
7. Pilot test, evaluate and critique the course
8. Make modification and adjustments to the course
9. Approved training begins
10. Implement training measurement follow-up plan
11. Continue to monitor, evaluate and make adjustments to the training course as necessary

Industrial Training Development Process Flowchart

Constant communication with management is important. They must stay abreast of training development plans. Training may not be the problem. A lack of knowledge or skill requires training; other difficulties may require management action of another sort. The most critical phase of the whole process is in assessing needs and communicating them to management. This discussion often reveals a difference in how the needs are perceived.

The flowchart at Figure R-1 will serve as a guide for the college training developers to better understand how an industry would develop a training program.

Part 2 - BENEFITS

Technicians trained to standard is a common goal for technical colleges and industry. Training must be flexible and modular to keep up with changes in manufacturing technology. The nation's manufacturers need to be assured of an available supply of trained, fundamentally sound technicians; access to cutting-edge applied research facilities, and the educational expertise needed to retrain their workers. Colleges will continue to require funds, equipment, research ideas, jobs for their graduates, and the reputation of industry access required to attract both faculty and students. Benefits to both the college and industry are numerous. Below is a listing of some of those benefits.

Benefits to the College

- Recruitment of potential students
- Exposure to business and industry
- Increases credibility of the faculty and programs
- Confirms donations
- Provides potential advisory committee members
- Provides potential industry cooperative committee members
- Industrial support for state funding and legislation
- Contract hours
- Establishment of cooperative education programs for students
- Potential employment for graduates
- Faculty internships with industry
- Tours of industrial plants
- Speakers for classes
- Update faculty with changes in industry
- Purchase of equipment and supplies for the department

Benefits to Industry

- Improved employee morale
- The solution to immediate training problems and needs
- Increased growth potential in the marketplace
- Reduced employee turnover and cost
- Long-term stability of repeat business from satisfied customers
- Increased profits (return on training investment)
- Increased revenue from sales (short and long-term)
- Development of an updated training program
- Updated duties and tasks lists
- Competency Profiles Validated
- An inventory of current training materials, pilot tested, validated and proven to meet industry needs

Part 3 - MARKETING

Interested colleges will research the industrial market before developing an implementation plan. They must get answers to many questions, such as:

1. Are the program courses going to be offered for credit?
2. Are state support funds available?
3. Who is the competition?
4. Can the training be done on or off-campus?
5. What is going to be the cost for the program and the courses?

Once the college addresses these questions, then industry must determine its organizational strengths and weaknesses for doing this type of training, followed by a selection of the best possible training method for implementation, marketing, and training.

The marketing items presented below are to serve as tools to help the college promote their training program.

Promotional Video and Brochure
A program video and program brochure could be produced by the college to serve as a marketing tool for the college trainers. It is expected that this will expedite the marketing process for colleges offering training to industry. Both of these products could provide an overview of the training philosophy and course offerings. The video and brochure could prove to be very beneficial to industry personnel. These promotional items could be distributed to someone that expresses an interest in remote training and then a follow-up appointment should be made to further explain the training program.

Promotional Catalog Offerings
A six-month seminar catalog at Figure R-4 lists available courses. It should be used to provide details about the curriculum, individual courses, training dates and costs. This is a good way to get immediate response on the complete training program. It also has an example registration form.

Promotional Course Brochure and Cover Letter
A specific course brochure could also be produced which could be used to advertise a particular course offering. It would provide such information as time, location, prospective attendees, cost and major topics to be covered. It also includes a registration form with a method for payment.

It is recommended that this brochure be mailed in a printed college logo #10 envelope, with a cover letter and a #9 return postage paid envelope. The cover letter can be more personal and provide additional information about the details of the training program.

News Release
A News Release (example at Figure R-5) will serve as announcement to the media about the development and implementation of a new college training program. It should be released to local television, radio, and newspapers and follow-up contacts made for possible interviews and presentations. This publicity is usually free. Most colleges have some form of Marketing and Communications Office to provide assistance and guidance. News Releases can also be tailored for individual courses.

Part 4 - TRAINING PROCESS AND SUPPORT DOCUMENTS

Included in this Remote Site/Industrial Training Model are samples of a training process and support documents that can be developed for individual college remote site training programs. These training processes and documents serve as examples and can be modified to fit a unique training program. The examples in Appendix B refer to classes being offered as seminars and workshops for non-credit, they could also be offered as credit classes.

Seminars/Workshops Process

The document at Figure R-6 is used to provide an overall operational process that moves from the planning stage, to conducting the class and the follow-up. It includes twenty different operations including: planning, public relations, facilities, schedules, refreshments and lunches, accommodations, registration, mailing lists, checklists, letters of agreement, time sheet and payroll, files, publications, visitor literature, invoicing, parking/security/telephone operator, certificates, evaluation, seminar schedule and follow-up.

Seminars/Workshops Personnel

The document at Figure R-7 should be used for planning personnel requirements needed to complete all of the operational processes. Depending upon the particular training plan, four personnel would be required to provide the support and coordination. A director who could perform the management functions, a program support person to take care of the registrations, scheduling, class participants, class activities and provide support to the instructor, a coordinator who would arrange for a classroom, refreshments/lunches, accommodations, parking/transportation and messages, and a clerical support person who would take care of the telephone registration, mail, fax, confirmations, files, invoicing, computer processes, and mailing lists.

Seminar Countdown Time Line

The form at Figure R-8 is used as a checklist to insure that all details have been covered prior to the start of the class. This time line is based upon an eight week schedule prior to a seminar and covers eighty-five checklist items.

Request from Business and Industry

The form at Figure R-9 is used by college personnel as the initial contact with industry. It should be kept in a log book with a recorded number and all the blanks completely filled out. This form can be used to establish a mailing list for future fliers and brochures. At the point of contact, an appointment time should be confirmed with the industry person to further discuss the company's training needs. An additional piece of paper can be attached to this request form that would serve as an activities log for recording additional meeting dates and those results.

Seminar Registration Form

The form at Figure R-10 is used to register all participants for a particular seminar class. It includes spaces for names, company, address, telephone/fax numbers, housing information, and method of payment.

Seminars & Workshops Enrollment Confirmation

The form at Figure R-11 is used to confirm by mail or fax the participant enrollment in the seminar. It provides information such as the name of the enrolled trainee, name of seminar, training dates and times, seminar location and the confirmation number. It provides other information to the trainee such as substitutions, cancellations, Continuing Educations Units (CEUs) and describes expenses that are tax deductible.

Campus Map
A map of your college campus should be used to provide the location were the training is going to be conducted. It is usually mailed or faxed with the enrollment confirmation form.

Hotel Accommodations
The information brochures at Figure R-12 should be mailed or faxed with the enrollment confirmation to provide a list of amenities offered, location and a toll free registration process. Special arrangements can be made with one hotel to become the host for these seminars.

Facility Reservation
The form at Figure R-13 is used for reserving classroom space, providing a description of the room configuration, audiovisual materials and any other special requests.

Refreshment/Lunch Arrangements
The form at Figure R-14 is used for requesting refreshments, lunch or other graduation activities for the seminar participants.

Class Enrollment
The form at Figure R-15 is used as the official enrollment document for the class participant. It provides all of the vital information needed for communication purposes. It collects important participant data that may be required by the colleges administration and can also serve as a record of payment for the college's business office.

Parking Permit and Rules
A parking permit is usually issued by the college to the class participant for short term parking on campus. Any parking information and rules should also be provided. Needless to say, it is embarrassing to have your invited guests receive a parking ticket or worse, have their vehicle towed. Work with your college's public safety and parking department to make sure all parking arrangements are complete.

Class Roster
The form at Figure R-16 is used primarily by the instructional personnel as an attachment to a class record folder. It provides most of the important information about the class and serves as a one page class fact sheet. Such things as the class name, number, training dates and times, instructor, hours, building and room location, cost and minimum and maximum class size are furnished. It also provides a list of class participants, their telephone numbers, notes and receipt information.

Class Attendance Record
The form at Figure R-17 is to be used by the instructional personnel to keep attendance records on class participants. The sample attached is a Weekly Attendance Record form. This form could be modified to include several weeks or months, or modified for any class length.

Evaluation
The form will be completed by the class participant and is designed to provide feedback to the instructor. It will include such things as the class name, instructor name and date as well as

several major points that will help the instructor improve the class or make necessary modifications. All evaluation forms should have a space for additional comments by the class participant. Attached to this Remote Site Training Model are three types of evaluation forms: 1) Evaluation (short) - has only ten items to be evaluated; 2) Course (long & detailed) - has twenty-seven items to be evaluated; and 3) Program Evaluation (quotation) - provides a place for comments that can by used in future marketing literature.

1. Evaluation (short) - The form at Figure R-18a is used when a class has been running successfully for more than three times. It has only ten major items that are evaluated on a scale of one to five (five being the highest). It has a few lines for additional comments.

2. Course Evaluation (long & detailed) - The form at Figure R-18b is used primarily for pilot classes. It is a two page document with four major topics and twenty-seven individual items to be evaluated on a scale of one to four (four being the highest). Each of the four major topics has a few lines for additional comments. It concludes with lines for any changes or recommendations for improvement and additional lines for other comments. It could be used for the first three classes.

3. Program Evaluation (quotation) - The form at Figure R-18c is used when you are looking for quotable comments that can be used for future publication literature. It contains the class participant's name and address. It also has more fill-in-the-blank spaces and asks for a contact person for a possible on-site presentation. An additional sheet can be attached that asks questions about the hotel, airport services, transportation, museums and restaurants.

Certificate of Completion

A Certificate of Completion from the college is used for awarding the Continuing Education Units (CEUs) from the college. This document is printed on good quality certificate type paper and usually includes two colors in the printing ink. It provides the name of the seminar participant, the date of completion, the number of CEUs earned, number of hours of training, title of course and the course objective.

Certificate of Competency

The document at Figure R-19 states that the participant has satisfactorily completed the required competencies acknowledged on the reverse side for the program in which they are enrolled. The backside of this certificate will contain the Competency Profile of the "Duties" and "Tasks" which were performed by the class participant. The instructors are requested to authenticate the degree of mastery achieved by the participant by checking the appropriate box each time the participant masters a competency.

Class Report

The form at Figure R-20 is used by the college when a class is completed. It contains some of the same information as the Class Roster, but also includes any grade records. It is usually filed with a state educational agency office and may be used for obtaining state funds for training with industry.

Instructor's Teaching Log

The form at Figure R-21 is used by the instructor for recording the teaching hours for one month. It includes instructor's name, month, year, seminar name and number, and the number of days in a month. It also includes a place for the instructor to record the actual teaching hours, comments, total hours and the instructor's signature.

Instructor's Payment Time Sheet

The form at Figure R-22 is used by the program director for paying the instructor. It is set up for a weekly pay activity; the amount of money to be paid, expected payment date and the director's signature.

Thank You

A “Thank You” note” or card could be used by the program director as a follow-up to the completion of the class; to be used as a personal note to the instructor, class participants, or the company.

APPENDIX - A

Appendix A.....of the MAST Remote Site/Industrial Training Model contains the documentation which is recommended to aid in the marketing of the seminar/workshop or training program.

ELEVEN-STEP INDUSTRIAL TRAINING DEVELOPMENT PROCESS

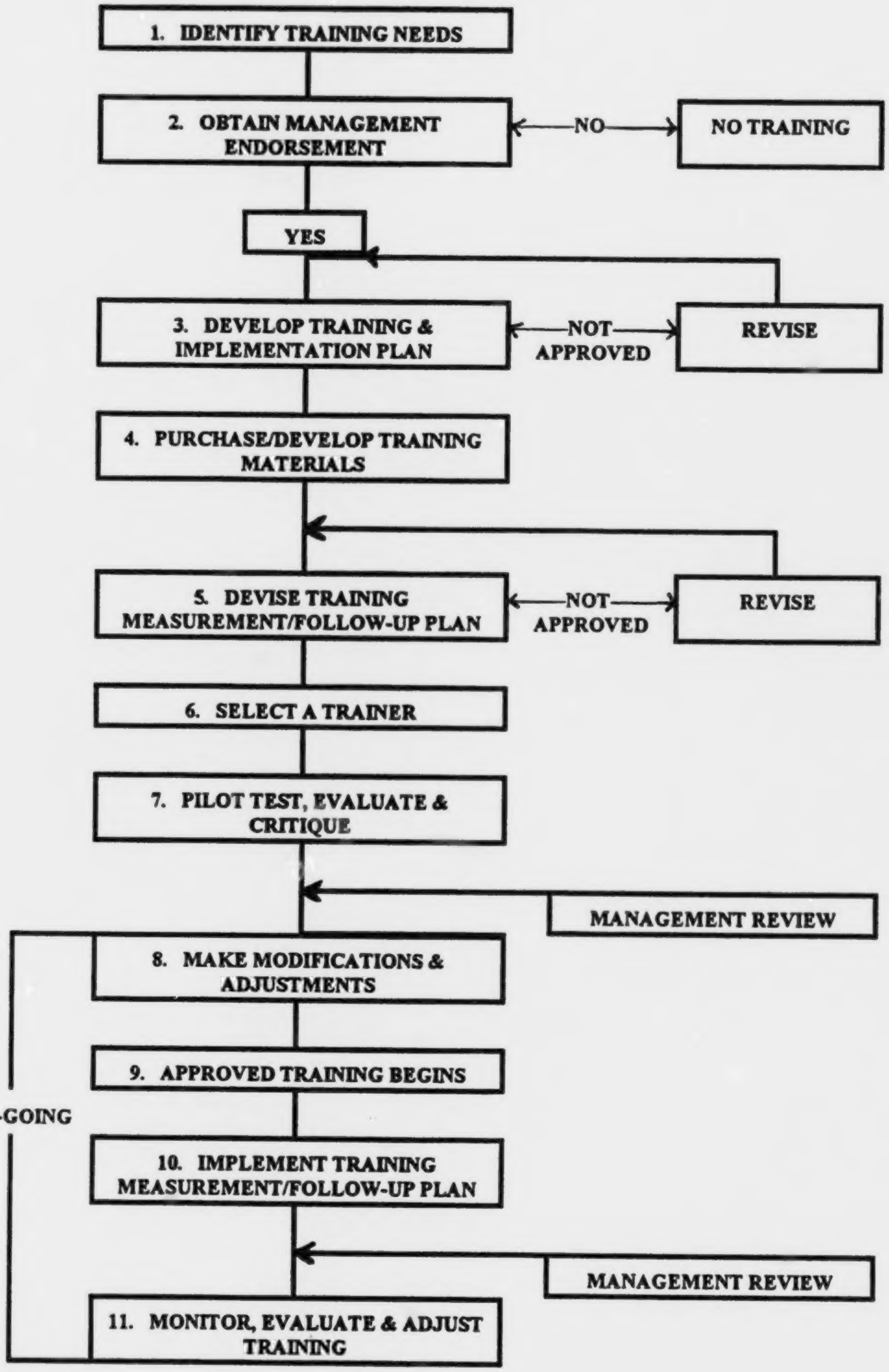
1. IDENTIFY TRAINING NEEDS
2. OBTAIN MANAGEMENT ENDORSEMENT
NO
NO TRAINING
YES
3. DEVELOP TRAINING & IMPLEMENTATION PLAN
NOT APPROVED
REVISE
4. PURCHASE/DEVELOP TRAINING MATERIALS
5. DEVISE TRAINING MEASUREMENT/FOLLOW-UP PLAN
NOT APPROVED
REVISE
6. SELECT A TRAINER
7. PILOT TEST, EVALUATE & CRITIQUE
MANAGEMENT REVIEW
8. MAKE MODIFICATIONS & ADJUSTMENTS
9. APPROVED TRAINING BEGINS
ON-GOING
10. IMPLEMENT TRAINING MEASUREMENT/FOLLOW-UP PLAN
MANAGEMENT REVIEW
11. MONITOR, EVALUATE & ADJUST TRAINING

Figure R-1

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INDUSTRIAL (REMOTE SITE) TRAINING

BENEFITS TO COLLEGES

WHAT'S IN IT FOR ME?

USING WITH THE REMOTE SITE TRAINING MODULES (DEVELOPED BY THE MAST PROGRAM), AND WORKING WITH YOUR LOCAL INDUSTRIES, YOUR LOCAL COLLEGE ECONOMIC DEVELOPMENT AND INDUSTRIAL TRAINING DIVISION CAN BE A PART OF IMPROVING THE CURRENT WORKFORCE THROUGH INDUSTRIAL (REMOTE SITE) TRAINING. BUT THE NUMBER ONE QUESTION, "WHAT IS IN IT FOR ME?" CAN BE ANSWERED BY THE FOLLOWING:

- **Recruitment of potential students**
- **Exposure to Business and Industry**
- **Increases Credibility of the Faculty and Programs**
- **Confirms Donations**
- **Provides Potential Advisory Committee Members**
- **Provides Potential School-industry Cooperative Committee Members**
- **Industrial Support for State Funding and Legislation**
- **Contract Hours**
- **Establishment of Cooperative Education Programs for Students**
- **Potential Employment for Graduates**
- **Faculty Internships with Industry**
- **Tours of Industrial Plants**
- **Speakers for Classes**
- **Update Faculty with Changes in Industry**
- **Purchase of Equipment and Supplies for the Department**

If you are interested in Industrial (Remote Site) Training, contact the MAST Program at (817) 867-4849 for more information about the Remote Site Training Modules...and then you can *experience* what is in it for you!

Figure R-2

INDUSTRIAL (REMOTE SITE) TRAINING

BENEFITS TO INDUSTRY

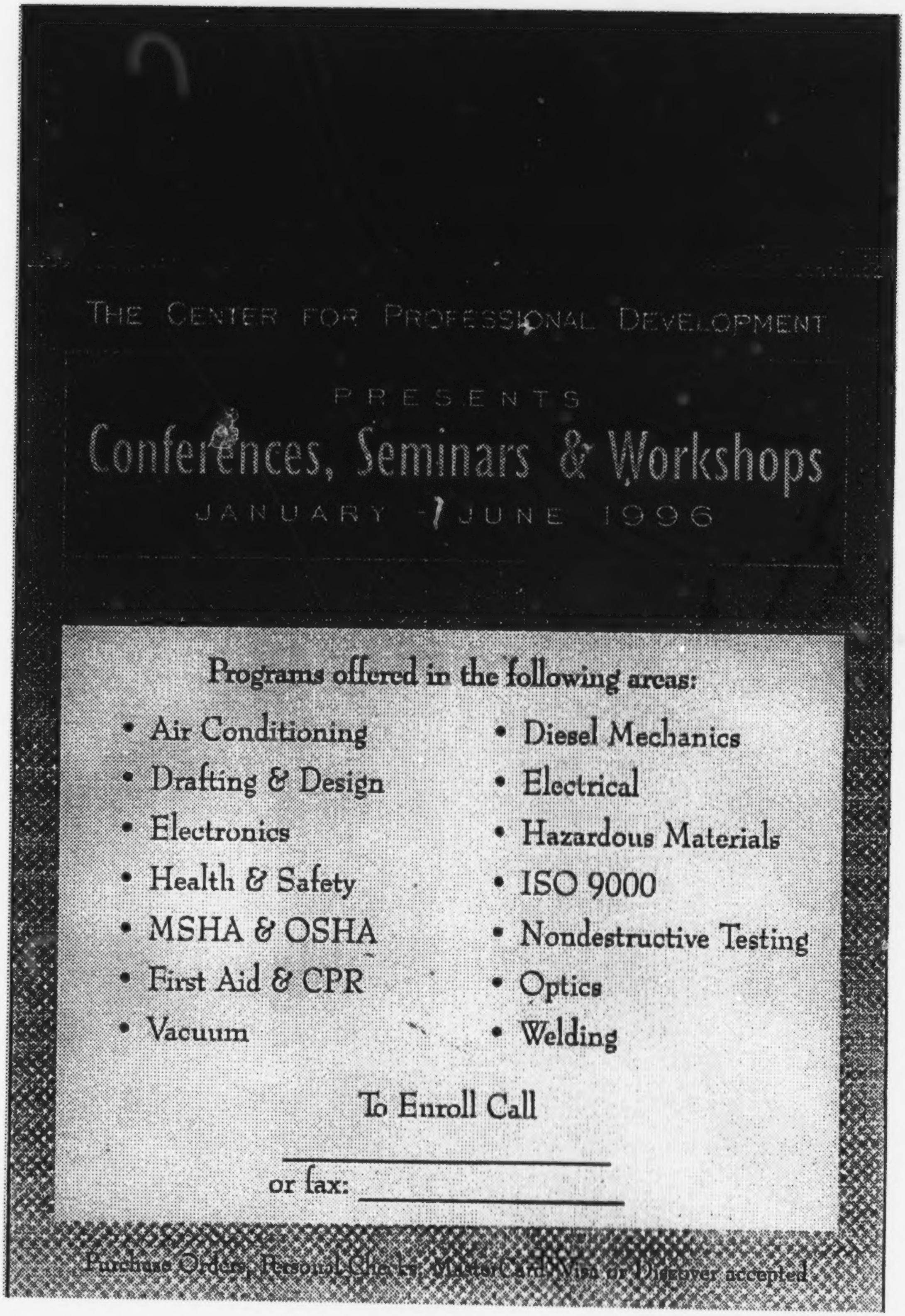
WHAT'S IN IT FOR ME?

WORKING WITH THE REMOTE SITE TRAINING MODULES (DEVELOPED BY THE MAST PROGRAM), AND WORKING THROUGH YOUR LOCAL COLLEGE ECONOMIC DEVELOPMENT AND INDUSTRIAL TRAINING DIVISION, YOUR COMPANY CAN BE A PART OF IMPROVING THE CURRENT WORKFORCE THROUGH INDUSTRIAL (REMOTE SITE) TRAINING. BUT THE NUMBER ONE QUESTION, "WHAT IS IN IT FOR ME?" CAN BE ANSWERED BY THE FOLLOWING:

- Improved Employee Morale
- The Solution to Immediate Training Problems and Needs
- Increased Growth Potential in the Marketplace
- Reduced Employee Turnover and Ccost
- Long-term Stability of Repeat Business from Satisfied Customers
- Increased Profits (Return on Training Investment)
- Increased Revenue from Sales (Short and Long-term)
- Development of an Updated Training Program
- Updated Duties and Tasks Lists (Job Descriptions)
- Competency Profiles Validated
- An Inventory of Current Training Materials, Pilot Tested, Validated and Proven to meet Industry Needs

If you are interested in Industrial (Remote Site) Training, contact your local technical or community college Industrial Training office...and then you can *experience* what is in it for you!

Figure R-3



THE CENTER FOR PROFESSIONAL DEVELOPMENT

PRESENTS

Conferences, Seminars & Workshops

JANUARY - JUNE 1996

Programs offered in the following areas:

- Air Conditioning
- Drafting & Design
- Electronics
- Health & Safety
- MSHA & OSHA
- First Aid & CPR
- Vacuum
- Diesel Mechanics
- Electrical
- Hazardous Materials
- ISO 9000
- Nondestructive Testing
- Optics
- Welding

To Enroll Call

____

or fax: ____________________

Purchase Orders, Personal Checks, MasterCard, Visa or Discover accepted

Figure R-4

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ASBESTOS ABATEMENT

Asbestos Abatement for Contractors/Supervisors
Hours: 40 Course Fee: $595
- March 18-22
- May 13-17

Asbestos Abatement for Contractors/Supervisors Refresher
Hours: 8 Course Fee: $185
- March 29
- May 24

Asbestos Abatement Workers
Hours: 32 Course Fee: $395
- February 20-23
- April 30-May 3

Workers Refresher
Hours: 8 Course Fee: $185
- February 19
- April 29

AIR CONDITIONING & REFRIGERATION PRINCIPLES

Basic Principles
Hours: 32 Course Fee: $395
- Feb. 27-March 1
- April 23-26
- June 25-28

Advanced Principles
Hours: 32 Course Fee: $395
- March 26-29
- May 28-31
- July 23-26

NEW! BASIC RADIATION PROTECTION

Hours: 32 Course Fee: $495
- March 4-8
- June 3-7

BASIC VACUUM TECHNIQUES

Hours: 24 Course Fee: $345
- March 6-8
- June 5-7

CONSTRUCTION SAFETY & HEALTH

Hours: 10 Course Fee: $145
- March 21-22
- May 23-24

NEW! DIESEL MECHANICS

Basic Heavy Equipment Hydraulics
Hours: 16 Course Fee: $195
- May 28-29

Diesel Engine Electronics Controls
Hours: 16 Course Fee: $245
- May 30-31

Diesel Engine Tune up
Hours: 16 Course Fee: $245
- May 23-24

Final Drive and Undercarriage
Hours: 16 Course Fee: $225
- May 28-29

Heavy Equipment Air Conditioning
Hours: 16 Course Fee: $245
- February 29 & March 1

Heavy Equipment Electrical Systems
Hours: 16 Course Fee: $245
- February 19-22 (Evenings)

Heavy Equipment Failure Analysis
Hours: 16 Course Fee: $195
- May 30-31

Small Air Cooled Engine Repair
Hours: 16 Course Fee: $145
- February 29 & March 1

Truck Brake Systems
Hours: 16 Course Fee: $195
- March 4-5

Truck Power Trains
Hours: 16 Course Fee: $195
- March 4-5

EFFECTIVE PERSONAL MANAGEMENT

Hours: 4.5 Course Fee: $179
- February 15
- March 19

ELECTRICAL

Electrical Safety-Related Work Practices
Hours: 7 Course Fee: $139
- February 23
- April 19
- June 21

Eddy Current Evaluation
Hours: 40 Course Fee: $495
- March 4-8
- May 20-24

Electromagnetic Interference/Electromagnetic Compatibility/Electromagnetic Pulse Testing (EMI/EMC/EMP)
Hours: 40 Course Fee: $495
- March 4-8
- June 3-7

ELECTRONICS

Electronics Part I
Hours: 80 Course Fee: $695
- April 8-19
- July 15-26

Electronics Part II
Hours: 80 Course Fee: $695
- April 29-May 10
- August 19-30

NEW! FIRST AID & CPR CERTIFICATION

Hours: 6 Course Fee: $30
- February 29
- May 12

HAZARDOUS MATERIALS

First Responder Awareness Level
Hours: 8 Course Fee: $185
- February 16
- April 19

Hazardous Material Technician
Hours: 24 Course Fee: $210
- Feb. 28-Mar. 1
- May 29-31

Hazardous Material Technician Refresher
Hours: 8 Course Fee: $185
- February 27
- May 28

Hazardous Wastesite Workers (HAZWOPER)
Hours: 40 Course Fee: $495
- March 4-8
- June 3-7

Hazardous Wastesite Workers (HAZWOPER) Refresher
Hours: 8 Course Fee: $185
- February 26
- June 10

NEW! HM-126F Transportation Safety
Hours: 8 Course Fee: $185
- April 17
- June 26

ISO 9000

Understanding ISO 9000
Hours: 8 Course Fee: $145
- March 14
- May 9
- July 11

Internal Auditing Process for ISO 9000
Hours: 8 Course Fee: $245
- March 28
- May 23
- July 25

LEAD ABATEMENT

Lead Abatement for Contractors/Supervisors
Hours: 40 Course Fee: $595
- March 11-15
- June 17-21

Lead Abatement for Contractors/Supervisors Refresher
Hours: 8 Course Fee: $185
- February 15
- April 18

Lead Abatement Worker
Hours: 32 Course Fee: $395
- March 25-28
- June 11-14

Lead Inspection Training
Hours: 24 Course Fee: $450
- February 12-14
- May 20-22

NEW! LENDERS WORKSHOP FOR RURAL GUARANTY LOANS

Hours: 7 Course Fee: $30
- February 23

MINE SAFETY & HEALTH ADMINISTRATION

90-Hour Electrical Certification
Hours: 90 Course Fee: $695
- January 15-19, 22-26 & 29
- May 6-10, 13-17 & 20

SHA Annual Refresher
Hours: 8 Course Fee: $60
- February 14
- April 17
- June 12
- March 20
- May 15

Electrical Refresher
Hours: 8 Course Fee: $60
- September 11
- November 13
- October 2
- December 11

Newly Employed Miner - Experienced
Hours: 6 Course Fee: $60
- February 14
- April 17
- June 12
- March 20
- May 15

Newly Employed Miner - Inexperienced
Hours: 24 Course Fee: $150
- March 26-28
- June 25-27

Train-The-Trainer
Hours: 24 Course Fee: $245
- August 6-8

OPTICS

Fundamental Principles Optics
Hours: 40 Course Fee: $495
- Feb. 26-Mar. 1
- May 20-24

Optical Tooling
Hours: 80 Course Fee: $695
- March 18-29
- June 10-21

Fiber Optics
Hours: 40 Course Fee: $495
- March 4-8
- June 3-7

WELDING

Certified Welding Inspector (CWI) Test Preparation
Hours: 36 Course Fee: $400
- January 15-19
- March 11-15
- May 13-17

Introduction to Welding Equipment Troubleshooting & Repair
Hours: 32 Course Fee: $395
- February 26-29
- May 28-31

Flux Core Arc Welding
Hours: 8 Course Fee: $95
- February 7
- April 3
- June 5

Gas Metal Arc Welding
Hours: 8 Course Fee: $95
- February 14
- April 10
- June 12

Gas Tungsten Arc Welding
Hours: 8 Course Fee: $95
- March 6
- May 1
- July 10

Welding Safety
Hours: 8 Course Fee: $95
- March 20
- May 8
- July 17

NEW! ENVIRO-SAFE CONFERENCE & EXPO

- September 17-19

ATTENTION ATTENDEES & EXHIBITORS
Early registration ends April 1
- Fee includes all presentations, lunches, breaks, seminars and materials
- Cancellation & refund no later than August 1

For more information call ____________

Pre-registration is required one week in advance for most seminars. Seminars requiring more advanced notice are noted.

All fees include instructional material, handouts, refreshments and coffee breaks.

All participants will receive Continuing Education Units (CEUs) and certificates upon successfully completing each seminar.

To schedule a seminar in your city, please call
____
for more information.

AIR CONDITIONING & REFRIGERATION PRINCIPLES SEMINARS

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **32-hour seminar** on **Basic Air Conditioning & Refrigeration Principles**, or **Advanced Air Conditioning & Refrigeration Principles.** These intense four-day seminars will include theory and hands-on lab troubleshooting exercises. The seminar does include 50 percent hands-on exercises in the labs of the Air Conditioning & Refrigeration Technology. A textbook will be provided to all seminar participants. Participants will be required to bring their own basic hand tools for opening up a unit and a volt meter. **Prerequisite required for Advanced seminar:** Participants need to have successfully completed Basic Air Conditioning & Refrigeration Principles seminar or equivalent training.

WHO SHOULD ATTEND?

Air Conditioning & Refrigeration Technicians

SEMINAR TOPICS

- Elements of the refrigeration cycle
- Shop safety practices & tools
- Basic automatic controls
- Heating & cooling
- Electrical controls
- Mechanical controls
- Troubleshooting

WHEN

Basic Principles, 32-hour seminar, 3.2 CEUs 8 a.m.- 5 p.m.

Seminar #(96-9204)	Tue. - Fri., February 27-March 1
Seminar #(96-9205)	Tue. - Fri., April 23-26
Seminar #(96-9206)	Tue. - Fri., June 25-28

COST: $395 per participant

Advanced Principles, 32-hour seminar, 3.2 CEUs 8 a.m.- 5 p.m.

Seminar #(96-9207)	Tue. - Fri., March 26-29
Seminar #(96-9208)	Tue. - Fri., May 28-31
Seminar #(96-9209)	Tue. - Fri., July 23-26

COST: $395 per participant

ASBESTOS ABATEMENT CERTIFICATION SEMINARS

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **five-day seminar on Asbestos Abatement for Contractors/Supervisors or a one-day refresher**. **The four-day seminar for the Asbestos Abatement Worker or a one-day refresher.** These seminars meet all Environmental Protection Agency (EPA) requirements with a registered certificate number and an identification card issued to participants upon completion.

WHO SHOULD ATTEND?

Contractors, consultants, supervisors, managers, pre-supervisors, foremen, safety officers, safety coordinators, or other professionals involved in the planning of asbestos abatement activities, or any worker who may encounter asbestos containing material (ACM) exposure during the course of their work activities.

CONTRACTORS/SUPERVISORS & REFRESHER

SEMINAR TOPICS

- Asbestos abatement laws for licensed or registered personnel who received training in other states
- Federal, state & local regulations
- Respiratory protection program
- Health effects
- Insurance & liability issues
- Glove-bag removal procedures
- Air monitoring
- Physical characteristics of asbestos & asbestos containing material (ACM)
- Decontamination units
- Contract specifications
- Medical surveillance programs
- Personal protective equipment
- State-of-the-art work practices/abatement activities

WHEN

Contractors/Supervisors, 40-hour seminar, 4.0 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9134)	Mon. - Fri., March 18-22
Seminar #(96-9135)	Mon. - Fri., May 13-17

COST: $595 per participant

Refresher, 8-hour seminar, 0.8 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9136)	Friday, March 29
Seminar #(96-9137)	Friday, May 24

COST: $185 per participant

WORKERS & REFRESHER

SEMINAR TOPICS

- Background information on asbestos
- Health effects & medical monitoring
- Federal, state & local regulations
- State-of-the-art work practices
- Air monitoring
- Respiratory protection
- Personal protective clothing
- Glove-bag removal procedures
- Decontamination units
- Negative air machines & HEPA filters
- Asbestos removal techniques

Asbestos Abatement Worker, 32-hour seminar, 3.2 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9138)	Mon. - Thurs., February 20-23
Seminar #(96-9139)	Mon. - Thurs., April 30-May 3

COST: $395 per participant

Refresher, 8-hour seminar, 0.8 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9210)	Friday, February 19
Seminar #(96-9211)	Monday, April 29

COST: $185 per participant

BASIC RADIATION PROTECTION

INTRODUCTION

ny Campus USA's Seminars & Workshops invites you to participate in a **32-hour seminar on Basic Radiation Protection.** This seminar is designed to train participants with a minimal scientific background in the fundamentals of radiation protection. Radiation safety criteria as applied to the disposal of low-level radioactive waste. Technical classroom sessions are supplemented with practical hands-on laboratory exercises. These training hours can be applied toward the regulated mandate training requirements required by the any state. ANY CAMPUS USA Radiation Protection Technology is licensed by the state's Bureau of Radiation Protection Control to provide training.

WHO SHOULD ATTEND?

Radiation safety professionals, safety officers, industrial hygienists, technicians, environmental personnel, supervisors, and anyone else involved in activities that may require training in radiation protection.

SEMINAR TOPICS

- Introduction to radiation protection & pre-test
- Radiation & matter
- Instrumentation
- Personnel monitoring
- Biological effects of radiation
- Radiation dose limits
- Applied health physics procedures
- Environmental radioactivity sampling & analysis
- Radioactive waste
- Review & post-test

WHEN

New! Basic Radiation Protection, 32-hour seminar, 3.2 CEUs

Seminar #(96-9214)	Mon. - Friday, March 4-8
Seminar #(96-9215)	Mon. - Friday, June 3-7

COST: $495 per participant. Will need a scientific pocket calculator.

Training Times: Monday 1-5 p.m.
Tuesday - Thursday 8 a.m.- 5 p.m.
Friday 8 a.m. - noon

BASIC VACUUM TECHNIQUES WORKSHOP

INTRODUCTION

Any Campus USAs Seminars & Workshops invites you to participate in a **24-hour workshop on Basic Vacuum Techniques.** This workshop is designed to give the participant a working knowledge and a basic understanding of vacuum technology with attention to fundamental theory, pumping principles, vacuum pumps, measurements, gauges auxiliary equipment, and basic vacuum systems. The systems covered will include mechanical systems, oil diffusion systems, turbo molecular systems, and cryogenic systems. The workshop will also include troubleshooting techniques, demonstrations and hands-on exercises to reinforce the materials covered in the classroom sessions.

WHO SHOULD ATTEND?

Technicians who work with vacuum systems or those who want a working knowledge of vacuum techniques.

ORKSHOP TOPICS

- Vacuum fundamentals
- Roughing pumps
- High vacuum pumps
- Ultrahigh vacuum pumps
- Gauges
- Vacuum materials & hardware
- Systems
- Troubleshooting
- Basic leak detection

WHEN

Basic Vacuum Techniques, 24-hour workshop 2.4 CEUs, 8 a.m. - 5 p.m.

Workshop #(96-9179)	Wed.-Fri., March 6-8
Workshop #(96-9180)	Wed.-Fri., June 5-7

Pre-registration required two-weeks before seminar.

COST: $345 per participant

CONSTRUCTION SAFETY AND HEALTH

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **10-hour seminar on Construction Safety & Health.** This seminar will be conducted on two days to allow for theory sessions and practical exercises in the review and interpretation of the standards published in the 29 CFR 1926. Participants will receive US Department of Labor certification for the seminar.

WHO SHOULD ATTEND?

Safety & health personnel, managers, and other persons who may be responsible for safety & health duties while working in the Construction Industry. *Prerequisite:* Some knowledge of the standards and 29 CFR 1926 would be helpful, but not necessary.

WHEN

Construction Safety and Health

10 hour seminar, 1.0 CEUs, 9 a.m. - 3 p.m.

Seminar #(96-9229)	Thur. - Fri., March 21-22
Seminar #(96-9230)	Thur. - Fri., May 23-24

Cost: $145 per participant

DIESEL MECHANICS SEMINARS

BASIC HEAVY EQUIPMENT HYDRAULICS

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **16-hour seminar on Basic Heavy Equipment Hydraulics.** This seminar addresses component identification, system types and their component locations, as well as the use of graphic symbols. Hydraulic principles such as the basic characteristics of liquids, definitions of horse power and work, relationships of pressure and flow to power as well as calculations of hydraulic efficiency are introduced so that the participant may compare "ideal values" to "actual situations". A systematic approach to troubleshooting addressing the use of hydraulic analyzers and pressure gauges caps off the latter part of the seminar.

WHO SHOULD ATTEND?

Diesel engine technicians, maintenance personnel, dealership personnel, equipment personnel, consultants, supervisors, managers, foremen, or anyone else involved in activities that may require trained hydraulic technicians.

SEMINAR TOPICS

- Hydraulic principles
- Component functions & symbols
- Types of circuits
- Troubleshooting

WHEN

New! Basic Heavy Equipment Hydraulics
16-hour seminar, 1.6 CEUs, 8 a.m. - 5 p.m.
Seminar #(96-9225) Tue. - Wed., May 28-29
COST: $195 per participant.
Please call ____________________ for additional training schedules.

DIESEL ENGINE ELECTRONICS CONTROLS

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **16-hour seminar on Diesel Engine Electronics Controls.** This seminar is designed as a basic electrical review for the diesel engine technician. This seminar will include how the basic computer system works on the diesel engine, the basic components used to make up the computer system, the standard programming used by most manufacturers that produce electronic unit injection engines, and the diagnostic principles used to find problems in the diesel computerized engines. The electronic diesel engines referenced will be Caterpillar (EUI), Detroit Diesel (DDEC), Cummins (CELECT), and Mack (V-MAC). *Prerequisite:* Heavy equipment electrical systems seminar.

WHO SHOULD ATTEND?

Diesel engine technicians, maintenance personnel, dealership personnel, equipment personnel, consultants, supervisors, managers, foremen, or anyone else involved in activities that may require trained diesel engine technicians.

SEMINAR TOPICS

- Review of electricity & testing
- Computer operations
- Common computer components
- Common diesel engine computer programming
- Diagnostics

WHEN

New! Diesel Engine Electronics Control
16-hour seminar, 1.6 CEUs, 8 a.m. - 5 p.m.
Seminar #(96-9226) Thur. - Fri., May 30-31
COST: $245 per participant.
Please call ____________________ for additional training schedules.

DIESEL ENGINE TUNE UP

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **16-hour seminar on Diesel Engine Tune up**. This seminar will present to the diesel engine technician the use of basic diesel engine principles to tune up a diesel engine, the procedures most commonly used by diesel engine manufacturers and common tune up practices used on Detroit, Cummins, and Caterpillar engines. This seminar is structured to provide approximately 50 percent hands-on laboratory exercises.

WHO SHOULD ATTEND?

Diesel engine technicians, maintenance personnel, dealership personnel, equipment personnel, consultants, supervisors, managers, foremen, or anyone else involved in activities that may require trained diesel engine tune up technicians.

SEMINAR TOPICS

- Engine operations
- Air induction service
- Basic engine
- Oil, cooling, & fuel systems

WHEN

New! Diesel Engine Tune up, 16-hour seminar, 1.6 CEUs,
8 a.m - 5 p.m.
Seminar #(96-9222) Thurs. - Fri., May 23-24
COST: $245 per participant.
Please call ____________________ for additional training schedules.

FINAL DRIVE AND UNDERCARRIAGE

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **16-hour seminar on Final Drive and Under carriage.** This seminar will include operation theory, evaluation of component wear, and repair methods for various designs of steering systems, final drives and undercarriage systems. This seminar is structured to provide approximately 60 percent hands-on exercises.

WHO SHOULD ATTEND?

Diesel engine technicians, maintenance personnel, dealership personnel, equipment personnel, consultants, supervisors, managers, foremen, or anyone else involved in activities that may require trained final drive and undercarriage technicians.

SEMINAR TOPICS

- Crawler steering systems
- Final drive types
- Undercarriage components

WHEN

New! Final Drive and Undercarriage
16-hour seminar, 1.6 CEUs, 8 a.m. - 5 p.m.
Seminar #(96-9223) Tues. - Wed., May 28-29
COST: $225 per participant.
Please call ____________________ for additional training schedules.

HEAVY EQUIPMENT AIR CONDITIONING

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **16-hour seminar on Heavy Equipment Air Conditioning.** This seminar covers the theory of refrigerant, system components, system controls, testing, repairing and servicing. The use of refrigerant recovery methods will also be discussed. Refrigerant Certification registration is also included in this seminar. This seminar is structured to provide approximately 60 percent hands-on exercises.

WHO SHOULD ATTEND?

Diesel engine technicians, maintenance personnel, dealership personnel, equipment personnel, consultants, supervisors, managers, foremen, or anyone else involved in activities that may require trained heavy equipment air conditioning technicians.

SEMINAR TOPICS

- Theory of operations
- System components
- Test equipment & tools required
- System test procedures
- System troubleshooting
- System servicing & repair

WHEN

New! Heavy Equipment Air Conditioning
16-hour seminar, 1.6 CEUs, 8 a.m. - 5 p.m.
Seminar #(96-9219) Thurs.- Fri., February 29-March 1
COST: $245 per participant.
Please call ____________________ for additional training schedules.

HEAVY EQUIPMENT ELECTRICAL SYSTEMS

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **16-hour seminar on Heavy Equipment Electrical Systems**. This minar will present the basic theory of electricity and how to use a Digital Volt Ohms Meter (DVOM) to work with voltage, amperage, and resistance. The application of Ohm's law to series circuit, parallel circuit, and series/parallel circuit and how magnetism and electromagnetism connect with electric current. The participant will use wiring schematics to trace circuit problems dealing with lighting, instrumentation, charging, and starting. The participant will learn how to use a hydrometer, refractometer, load tester, and charger to diagnose battery problems. This seminar is structured to provide approximately 60 percent hands-on exercises.

WHO SHOULD ATTEND?

Diesel engine technicians, maintenance personnel, dealership personnel, equipment personnel, consultants, supervisors, managers, foremen, or anyone else involved in activities that may require trained electrical technicians.

SEMINAR TOPICS

- Basic electricity
- Battery
- Wiring, lighting/instrumentation
- Charging system
- Starting system

WHEN

New! Heavy Equipment Electrical Systems
16-hour seminar, 1.6 CEUs, 6-10 p.m. (Evenings)
Seminar #(96-9217) Mon.-Thurs., February 19-22
COST: $245 per participant.
Please call ____________ for additional training schedules

HEAVY EQUIPMENT FAILURE ANALYSIS

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **16-hour seminar on Heavy Equipment Failure Analysis.** This seminar is a study of why parts fail. Emphasis is on basic metallurgy, wear, fractures, and visual analysis. Practical application is on diagnosis and testing parts to determine the possible cause of failure. This seminar is structured to provide approximately 50 percent hands-on exercises.

WHO SHOULD ATTEND?

Diesel engine technicians, maintenance personnel, dealership personnel, equipment personnel, consultants, supervisors, managers, foremen, or anyone else involved in activities that may require trained heavy equipment failure analysis technicians.

SEMINAR TOPICS

- Basic metallurgy
- Principles of wear
- Fractures
- Visual examination

WHEN

New! Heavy Equipment Failure Analysis
16-hour seminar, 1.6 CEUs, 8 a.m. - 5 p.m.
Seminar #(96-9224) Thurs. - Fri., May 30-31
COST: $195 per participant.
ase call ____________ for additional training schedules.

SMALL AIR COOLED ENGINE REPAIR

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **16-hour seminar on Small Air Cooled Engine Repair.** This seminar is designed to introduce the participant to basic fundamentals of small air cooled engines to include design, tuneup, overhaul and basic troubleshooting. This seminar is structured to provide approximately 90% hands-on exercises.

WHO SHOULD ATTEND?

Engine technicians, maintenance personnel, dealership personnel, equipment personnel, consultants, supervisors, managers, foremen, or anyone else involved in activities that may require trained small air cooled engine technicians.

SEMINAR TOPICS

- Operating principles of four-cycle engines
- Differentiate four-cycle small engines from two-cycle small engines
- Identify small engine components
- Function of small engine components
- Tune up a small engine
- Disassemble & assemble a small engine
- Troubleshoot a small engine

WHEN

New! Small Air Cooled Engines
16-hour seminar 1.6 CEUs, 8 a.m. - 5 p.m.
Seminar #(96-9218) Thurs.-Fri., February 29-March 1
COST: $145 per participant.
Please call ____________ for additional training schedules.

TRUCK BRAKE SYSTEMS

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **16-hour seminar on Truck Brake Systems.** This seminar will cover the principles and theory of air brakes systems and troubleshooting. It will also cover the foundation brakes. This seminar is structured to provide approximately 60 percent hands-on exercises.

WHO SHOULD ATTEND?

Diesel engine technicians, maintenance personnel, dealership personnel, equipment personnel, consultants, supervisors, managers, foremen, or anyone else involved in activities that may require trained truck brake technicians.

SEMINAR TOPICS

- Fundamentals of braking
- Dual air brake system principles
- Foundation brakes

WHEN

New! Truck Brake Systems, 16-hour seminar, 1.6 CEUs, 8 a.m. - 5 p.m.
Seminar #(96-9221) Mon.-Tues., March 4-5
COST: $195 per participant.
Please call ____________ for additional training schedules.

TRUCK POWER TRAINS

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **16-hour seminar on Truck Power Trains.** This seminar includes the disassemble, inspection and reassembly of the 9-speed and 13-speed transmissions.

WHO SHOULD ATTEND?

Diesel engine technicians, transmission technicians, maintenance personnel, dealership personnel, equipment personnel, consultants, supervisors, managers, foremen, or anyone else involved in activities that may require trained truck power trains technicians.

SEMINAR TOPICS

- Description of power trains
- Identification
- Lubrication
- Timing of the twin countershafts
- End clearance on the countershafts
- Input shaft replacement
- Power flow
- Drivelines & vibrations
- Clutches
- Air systems

WHEN

New! Truck Power Trains, 16-hour seminar, 1.6 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9220) Mon.-Tues., March 4-5

COST: $195 per participant.

Please call ________________ for additional training schedules.

EFFECTIVE PERSONAL MANAGEMENT WORKSHOP

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **4 1/2 hour workshop on Effective Personal Management.** This workshop is for professionals who have a need to become more proactive and improve productivity. Imagine having time to do the things that are really important to you. The Effective Personal Management Workshop provides you with the tools and the training to help you live a less stressful, more balanced life. Also, included in this workshop fee is a $75 value My-Tyme Success Planner organizer and a two hour follow-up workshop in 30 days.

OVERVIEW

In this Effective Personal Management Workshop participants will learn how to:

1. Find an additional 2-3 hours per day to work on important goals and high pay activities that you don't have time for now.
2. Increase your productivity by a minimum of 15-20%.
3. Gain control of your personal and professional time by scheduling your priorities.
4. Become more proactive and reduce stress levels by practicing the four steps of proactive self-management.
5. Manage all the commitments and promises made and accepted so that nothing slips through the cracks.

WHO SHOULD ATTEND?

Executives, managers, supervisors, contractors, pre-supervisors, foremen, project leaders, consultants, professionals, and anyone else interested in finding more time in their work schedule for doing High Pay Activities (HPA).

WHEN

4 1/2-hour workshop, 0.4 CEUs, 8 a.m. - 12:30 p.m.

Workshop #(96-9114)	Tuesday, January 23
Workshop #(96-9115)	Thursday, February 15
Workshop #(96-9116)	Tuesday, March 19

COST: $179 per participant

As an added bonus, your tuition for this seminar also includes a two hour follow-up workshop.

ELECTRICAL SEMINARS

EDDY CURRENT EVALUATION

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **40-hour workshop in nondestructive testing on Eddy Current Evaluation.** This workshop provides the participant with a knowledge of the principles, procedures, applications, and capabilities of eddy current inspection methods. This workshop is intended to enable the participant to determine that proper inspection techniques and procedures. This workshop also includes numerous hands-on laboratory exercises to reinforce the learning process. *Prerequisite:* Participants should possess a knowledge of basic electricity.

WORKSHOP TOPICS

- Review of basic electrical & magnetic theory and terms
- Eddy Current Theory
- Types of sensing elements
- Factors which affect coil impedance
- Signal/noise ratio
- Selection of test frequency
- Coupling
- Field strength & its selection
- Instrument design considerations
- Read-out mechanism
- Applications
- Standards & operating procedures
- Overview & discussion of American Society For Testing Material standards
- Review of available equipment
- Review of codes, specifications and standards
- Quizzes & discussions
- Tests: open book
- Basic theory
- Specific applications
- Practical applications

WHEN

Eddy Current Evaluation, 40-hour workshop 4.0 CEUs, 8 a.m. - 5 p.m.

Workshop #(96-9194)	Mon.-Fri., March 4-8
Workshop #(95-9195)	Mon.-Fri, May 20-24

Pre-registration required two-weeks before seminar.

COST: $495 per participant

Please call ____________ for training dates. Also, if you are interested in other Nondestructive Testing workshops on Radiographic Evaluation, Ultrasonic Evaluation, Liquid Penetrant Evaluation, and Magnetic Particle Evaluation, call us to arrange a workshop.

ELECTRICAL SAFETY-RELATED WORK PRACTICES

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **one-day seminar on Electrical Safety-Related Work Practices.** This seminar is based upon current Occupational Safety and Health Administration Electrical Safety Work Rules and is designed to satisfy the training requirement of these rules.

WHO SHOULD ATTEND?

Maintenance personnel, electricians, mechanics, repairers, engineers, technicians, safety coordinators, loss control specialists, supervisors, pre-supervisors, administrators and management personnel. Management and administrative personnel may also wish to attend so that they may evaluate their company's safety program, establish lockout/tagout procedures, and identify the training needs of their employees.

SEMINAR TOPICS

- OSHA 29 CFR Subpart S—Electrical
- Safety-related work practices
- 1910.331 Scope
- 1910.332 Training
- 1910.333 Selection and use of work practices
- 1910.334 Use of equipment
- 1910.335 Safeguards for personal protection
- Lockout/Tagout procedures
- 1910.147 Control of hazardous energy
- Employee protection
- Energy control procedures and applications
- Communications
- Equipment grounding procedures
- Most often cited examples
- Electrical safety

WHEN

Electrical Safety-Related Work Practices
7-hour seminar, 0.7 CEUs, 8:30 a.m. - 4:30 p.m.

Seminar #(96-9191)	Friday, February 23
Seminar #(96-9192)	Friday, April 19
Seminar #(96-9193)	Friday, June 21

COST: $139 per participant.
Enroll three from the same company and the fourth attends free.

ELECTROMAGNETIC INTERFERENCE/ELECTROMAGNETIC COMPATIBILITY/ ELECTROMAGNETIC PULSE TESTING (EMI/EMC/EMP)

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **40-hour workshop on Electromagnetic Interference/ Electromagnetic Compatibility/Electromagnetic Pulse Testing (EMI/EMC/EMP)**. This workshop will focus on the format application and implementation of the military standards. Mathematical considerations, including power ratios (decibels), will be reviewed. The definitions and terms related to EMI/EMC/EMP will be studied and discussed. *Prerequisite:* Participants should have a good background in quality aspects of electrical and electronic commodities and have completed Electronics Part I and Electronics Part II, or equivalent experience. A solid knowledge of basic algebra and trigonometry is required.

WORKSHOP TOPICS

- The Decibel
  - Antilogy who numbers and fractions for the common logs with a logarithm chart
  - Calculate path loss
  - Common and Natural Logarithms
  - Convert watts and milliwatts to dB and/or dBm
  - Convert volts to dBW and vise versa
  - Define and calculate dB
  - Defining Decibels
  - Equations using common logs
  - Formulas for calculating decibels
  - Identify the Base, the Log, and the Antilogy
  - Log whole numbers for the common logs with a logarithm chart
  - Log fractions for the common logs with a logarithm chart
  - Overall system operation signal strength
  - References for dBW and dBm
  - The dB formula to calculate the unknown value
  - The dBm formula to calculate the unknown value
- EMI/EMC/EMP
  - Identify EMI/EMC/EMP an their sources
  - Production of EMI/EMC/EMP
  - Reducing EMI/EMC/EMP
  - State the electromagnetic spectrum
  - Terms related to EMI/EMC/EMP
  - Testing procedures for EMI/EMC/EMP

WHEN

Electromagnetic Interference/Electromagnetic Compatibility/ Electromagnetic Pulse Testing
40-hour workshop 4.0 CEUs, 8 a.m. - 5 p.m.

Workshop #(96-9196)	Mon.-Fri., March 4-8
Workshop #(96-9197)	Mon.-Fri., June 3-7

Pre-registration is required two-weeks before workshop.
COST: $495 per participant

ELECTRONICS SEMINARS

ELECTRONICS PART I

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in an **80-hour workshop on Electronics Part I**. This workshop will give the participant a better understanding of the fundamental principles of electricity. A comprehensive review of all necessary mathematical concepts is first presented, starting with decimals and fractions, and in an orderly development continues by steps to elementary plane trigonometry. After completing the development of math, participants are introduced to the fundamental concepts of electricity, starting with sources of electricity magnetism, and direct current theory.

During all phases of the program, participants are given opportunities to put their newly acquired theories to use through supervised practical exercises. Using a step-by-step procedure, the students are then taught the theories and uses of alternating current generation, and AC circuits, including impedance and resonance. During the final week, a complete review and examination are scheduled to further aid the participant in retaining the knowledge gained during the course. *Prerequisite:* Participants should have a knowledge of high school-level algebra.

WORKSHOP TOPICS

- Nature of electricity
- Resistance
- Ohms Law
- Series & parallel circuits
- Apply Kirchoffs' Laws to Series & Parallel Circuits
- Analyze series-parallel circuits
- Applying network circuit theorems
- Measurement devices
- Capacitors in DC circuits
- Investigate magnetism
- Inductors in DC circuits
- Exponential formulas and calculations to DC Circuits
- Charging and discharging rates for capacitive and inductive circuits
- AC waveforms
- Evaluate Reactance and its effect on the phase relationship between voltage and current in AC circuits
- Solve for voltage, current, impedance, and power
- Distribution in series, parallel and series-parallel circuits using Ohms' Law, Kirchoffs' and Watts' Laws
- Analyze transformer circuits and characteristics
- Analyze circuits at resonances
- Basic characteristics of common filters

WHEN

Electronics Part I, 80-hour workshop, 8.0 CEUs, 8 a.m. - 5 p.m.

Workshop #(96-9187)	Mon.-Fri., April 8-19
Workshop #(96-9188)	Mon.-Fri., July 15-26

Pre-registration required two weeks before workshop.
COST: $695 per participant

ELECTRONICS PART II

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **80-hour workshop on Electronics Part II**. This workshop will allow the participant to acquire the basic knowledge and principles involved in electronic circuits, semiconductors, integrated circuits and power supplies. Motors and other electronic items will be addressed in order for the student to understand the manufacturing processes associated with electronic equipment.

This workshop also includes the use of electronic measuring equipment and a large variety of common test equipment. Numerous hands-on laboratory exercises are included in the workshop to reinforce the learning process. Participants will complete an electronic project to keep. *Prerequisite:* Participants should have a good background in quality aspects of electrical and electronic commodities and must have completed Electronics Part 1 or have equivalent experience.

WORKSHOP TOPICS

- Semiconductor materials
  - Silicon and germanium atoms & crystals
  - Conduction in pure silicon & germanium
  - Doping silicon & germanium
- Silicon & germanium diodes
  - The PN junction
  - Forward biased diode
  - Reverse biased diode
  - V-1 characteristics of diodes
- Diode characteristics: simplified & approximated
  - The ideal diode
  - Simplification of diode characteristics
  - Reverse bias resistance of diodes
- Diode applications
  - Super position of DC & AC
  - Half-wave & full-wave rectifier
  - Bridge rectifier
  - Voltage doublers
- Zener diodes
  - Zener characteristics
  - Zener as regulators
- Bipolar junction transistor
  - PNP & NPN junctions
  - Relationship of Ic, Ib, Ie
- Common-emitter
  - DC & AC consideration
  - Cascaded stages
  - AC load lines
- Common-Base Connection
  - Super Position of DC & AC Signals
  - Determining Voltage Gain & Current Gain
  - High-Resistance Signal Source vs Gain
- Common-Collector
  - Input-output characteristics
  - Voltage and current gain
- Power Amplifiers
  - Push-pull transformer coupled power amplifier
  - Complimentary-paid outputs
  - Temperature considerations
- Solid state devices
  - FET, UJT, SCR, TRIAC, & DIAC
  - Application, substitution & modification of circuit parameters

WHEN

Electronics Part II, 80-hour, 8.0 CEUs, 8 a.m. - 5 p.m.

Workshop #(96-9189) Mon.-Fri., April 29-May 10
Workshop #(96-9190) Mon.-Fri., August 19-30

Pre-registration required two weeks before workshop.

COST: $695 per participant.

FIRST AID AND CPR CERTIFICATION

INTRODUCTION

Any Campus USA's Seminars & Workshop invites you to participate in a **6-hour seminar on First Aid and Cardiopulmonary Resuscitation (CPR).** This seminar will provide necessary training for National Safety Council Certification for First Aid and CPR Level I or II.

WHO SHOULD ATTEND?

Contractors, consultants, supervisors, managers, foremen, safety officers or coordinators, health care workers, general public or anyone else involved in activities that may require trained first aid and CPR persons.

SEMINAR TOPICS

- Adult CPR, child CPR, & infant CPR
- Airway obstruction
- Rescue breathing
- Bleeding control
- Muscle, bone & joint injuries
- Poisoning
- Shock
- Burns
- Heat/cold emergencies
- Stroke
- Diabetic emergencies
- Seizures
- Patient assessment

WHEN?

New! First Aid and CPR, 6-hour seminar, 0.6 CEUs, 9 a.m. - 3 p.m.

Seminar #(96-9212) Thursday, February 29
Seminar #(96-9213) Thursday, May 12

COST: $30 per participant.

HAZARDOUS MATERIALS CERTIFICATION SEMINARS

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **one-day seminar for Hazardous Material First Responder Awareness Level, or a three-day seminar for the Hazardous Material Technician or a one-day refresher.**

We also offer a **five-day seminar for the Hazardous Wastesite Worker (HAZWOPER) or a one-day refresher.** These seminars cover OSHA's 29 CFR 1910.120, Hazardous Wastesite Workers (HAZWOPER) Training.

All seminars meet all Environmental Protection Agency (EPA) requirements with a registered certificate number issued to participants upon successful completion.

WHO SHOULD ATTEND?

Safety officers, safety coordinators, human resource personnel, supervisors, pre-supervisors, foremen, management personnel, production personnel and other personnel who work around hazardous materials.

FIRST RESPONDER AWARENESS LEVEL

SEMINAR TOPICS

- OSHA's 29 CFR 1910.120 & Hazardous Material First Responder Awareness Level Training

- Knowledge of the materials & procedures in process in the plant work area
- Selection, use & limitation of personal protective equipment
- Applied information from the MSDS used in the plant operations
- Basic control, confirmation, and containment within resources & limits of the available emergency equipment
- Basic decontamination procedures
- Relevant standard operating procedures & shut-down processes

WHEN

First Responder Awareness Level, 8-hour seminar, 0.8 CEUs, 8 a.m. - 5 p.m.

Seminar # (96-9124)	Friday, February 16
Seminar # (96-9125)	Friday, April 19

COST: $185 per participant

HAZARDOUS MATERIAL TECHNICIAN & REFRESHER

SEMINAR TOPICS

- OSHA's 29 CFR 1910.120 & Hazardous Material Technician Level Training
- How to initiate & implement the emergency response plan
- Identification of site materials & hazards
- Assigned roles in the incident command system
- Use and application of protective equipment & specialized containment of spill/clean-up materials
- Decontamination procedures used in the emergency response program
- Hazard & risk assessment techniques
- Proper use of shut-down procedures & evaluation of the affected areas
- Understanding basic chemical toxicology & the terms involved with behavioral response

WHEN

Technician, 24-hour seminar, 2.4 CEUs, 8 a.m. - 5 p.m.

Seminar # (96-9126)	Wed. - Fri., February 28-March 1
Seminar # (96-9127)	Wed. - Fri., May 29-31

COST: $210 per participant

Technician Refresher, 8-hour seminar, 0.8 CEUs, 8 a.m. - 5 p.m.

Seminar # (96-9128)	Tuesday, February 27
Seminar # (96-9129)	Tuesday, May 28

COST: $185 per participant

HAZARDOUS WASTESITE WORKERS (HAZWOPER) & REFRESHER SEMINARS

SEMINAR TOPICS

- Hazard recognition, evaluation & control
- Toxicology/exposure guidelines
- Sources of information & assistance
- Monitoring & detection devices
- Protective clothing & equipment
- Site entry & control
- Decontamination procedures

WHEN

HAZWOPER, 40-hour seminar, 4.0 CEUs 8 a.m. - 5 p.m.

Seminar # (96-9130)	Mon. - Fri., March 4-8
Seminar # (96-9131)	Mon. - Fri., June 3-7

COST: $495 per participant

HAZWOPER Refresher, 8-hour seminar, 0.8 CEUs, 8 a.m. - 5 p.m.

Seminar # (96-9132)	Monday, February 26
Seminar # (96-9133)	Monday, June 10

COST: $185 per participant

HM-126F TRANSPORTATION SAFETY

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in an **8-hour seminar on HM-126F Transportation Safety.** This seminar is designed to reach personnel who are exposed to hazardous materials in an area such as a warehouse and loading docks. This seminar is developed to meet the requirements of Docket HM126F (49 CFR Parts 171-177). According to this rule, everyone who handles or transports packages containing hazardous materials must have safety training.

WHO SHOULD ATTEND?

Safety officers, safety coordinators, warehouse personnel, truckers, purchasing agents, consultants, supervisors, managers, foremen, and other personnel who work around hazardous materials where the potential for an accident exists.

SEMINAR TOPICS

- 49 CFR 172.101 table
- Marking, labeling and shipping papers
- Standard operating procedures
- Site-and function-specific safety training
- HM-181 transition progress

WHEN

New! HM-126F Transportation Safety, 8-hour, 0.8 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9227)	Wednesday, April 17
Seminar #(96-9228)	Wednesday, June 26

COST: $185 per participant.

ISO 9000 SEMINARS

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **one-day seminar on Internal Auditing Process for ISO 9000 or Understanding ISO 9000.** These seminars are designed to help the participants become familiar with concepts and benefits of a quality standard that will provide their company with a competitive advantage.

INTERNAL AUDITING PROCESS FOR ISO 9000

WHO SHOULD ATTEND?

Engineers, quality personnel, manufacturing and production managers, supervisors and operators, as well as consultants and senior management. Employees of companies thinking about ISO registration should also attend.

SEMINAR TOPICS

- Quality Systems
- Auditing - Quality assurance systems
- Elements of the audit

WHEN

Internal Auditing Process for ISO 9000

8-hour seminar, 0.8 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9201)	Thursday, March 28
Seminar #(96-9202)	Thursday, May 23
Seminar #(96-9203)	Thursday, July 25

Pre-registration required two-weeks before seminar.

COST: $245 per participant. Registration fee includes lunch and a ISO 9000 notebook.

UNDERSTANDING ISO 9000

WHO SHOULD ATTEND?

Managers with no prior ISO training, quality managers, engineers and production supervisors, TQM team members, CEOs, owners and others interested in ISO 9000. Employees of companies thinking about ISO registration should also attend.

SEMINAR TOPICS

The seminar helps answer questions like
- What is ISO 9000? + Is ISO 9000 for me?
- Why should I become registered?
- What is meant by the 20 elements of ISO 9001?
- How many parts are there in the ISO 9000 series?
- What is quality policy manual?
- What will ISO 9000 do for my company in terms of return on investment?
- Do I have to become registered?
- What is document control and how do I achieve it?
- What is management's responsibility in the quality program?

WHEN

Understanding ISO 9000, 8-hour seminar, 0.8 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9198)	Thursday, March 14
Seminar #(96-9199)	Thursday, May 9
Seminar #(96-9200)	Thursday, July 11

Pre-registration required two-weeks before seminar.
COST: $145 per participant. Registration fee includes lunch and a ISO 9000 handbook.

LEAD ABATEMENT CERTIFICATION SEMINARS

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **five-day seminar on Lead Abatement for Contractors/Supervisors or a one-day refresher.**

The **32-hour seminar on Lead Abatement Worker Training** is for workers who remove lead in the course of work. The seminar will provide information on lead-based paint abatement and regulatory guidelines. Abatement methods and strategies, worker protection procedures and waste disposal will also be discussed.

The **24-hour seminar on Lead Inspector Training** is an intensive three-day seminar designed to primarily focus on inspection for lead-based paint. All other sources of lead exposure are also part of the curriculum. All seminars meet all Environmental Protection Agency (EPA) requirements with a registered certificate number issued to participants upon successful completion.

WHO SHOULD ATTEND?

Contractors, supervisors, pre-supervisors, foremen, project leaders, consultants, safety officers, safety coordinators, inspectors, construction workers or anyone else interested in lead abatement.

CONTRACTORS/SUPERVISORS & REFRESHER

SEMINAR TOPICS

- Legal & insurance issues
- Hazard recognition & control
- Personal protective equipment
- Employee information & training
- Project management
- Waste disposal
- Lead paint abatement
- History of lead & its uses
- Regulatory review
- Interior dust abatement
- Soil & exterior dust abatement
- Cost estimations
- Community relations processes
- Paint, soil, dust & air sampling
- Supervisor techniques
- Recordkeeping
- Development of pre-abatement work plan
- Contract specifications

WHEN

Contractors/Supervisors, 40-hour seminar, 4.0 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9140)	Mon. - Fri., March 11-15
Seminar #(96-9141)	Mon. - Fri., June 17-21

COST: $595 per participant

Refresher, 8-hour refresher seminar, 0.8 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9142)	Thursday, February 15
Seminar #(96-9143)	Thursday, April 18

COST: $185 per participant

LEAD ABATEMENT WORKER TRAINING

SEMINAR TOPICS

- Lead hazards
- Laws, regulations & standards
- Worker protection
- Control of lead hazards
- Special cleaning methods
- Abatement methods
- Cleanup, disposal & clearance
- Other health & safety problems
- Background information & health effects of lead
- Waste disposal

WHEN

Lead Abatement Worker Training
32-hour seminar, 3.2 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9144)	Mon. - Thur., March 25-28
Seminar #(96-9145)	Tues. - Fri., June 11-14

COST: $395 per participant

LEAD INSPECTOR TRAINING

SEMINAR TOPICS

- Lead sources
- Regulatory background & guidelines
- Lead testings methods
- Testing other media for lead
- Field inspection methods
- Safety & effects of lead
- Sampling plan
- Personal protective equipment
- Recordkeeping

WHEN

Lead Inspector Training, 24-hour seminar, 3.2 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9146)	Mon. - Wed., February 12-14
Seminar #(96-9147)	Mon. - Wed., May 20-22

COST: $450 per participant

LENDERS WORKSHOP FOR GUARANTY LOANS

INTRODUCTION

ny Campus USA's Seminars & Workshops and Any State's Certified Development Company (CTCDC) invite you to participate in a **one-day seminar** featuring the the state's Agriculture Finance Authority's "Added Value" Loan Guaranty Program and the Rural Economic and Community Development "Rural Business and Industry" Loan Guaranty Program. An in-depth presentation will be made on the particulars of these programs. Certified Public Accountant (CPA) attendee forms are available for record of satisfactory completion of Continuing Education credit applicable to the State Board of Public Accountancy.

WHO SHOULD ATTEND?

The workshop is directed at private-sector lenders to include presidents, chief executive officers and commercial loan officers. The workshop will also be of importance to certified public accountants, and others who are interested in business and economic development.

SEMINAR TOPICS

- Introduction to the RBI & TAFA programs
- Particulars of the programs
- Eligible borrowers and projects
- Application processing
- Underwriting criteria
- Lenders responsibility
- Secondary market potential
- A "Q&A" session

WHEN

nders Workshop for Rural Guaranty Loans
hour seminar, 0.8 CEUs, 9 a.m. - 4 p.m.

Seminar #(96-9034)	Friday, February 23

COST: $30 per participant. CDC Members $20

MINE SAFETY AND HEALTH SEMINARS

90-HOUR ELECTRICAL CERTIFICATION

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **90-hour seminar for Electrical Certification.** This seminar is required by the Mine Safety and Health Administration (MSHA). An electrical experience application must be reviewed & approved by MSHA four weeks before the seminar.

WHO SHOULD ATTEND?

Any person who wants to work at a mine site as an electrician.

SEMINAR TOPICS

- Direct current theory & application
- Low and medium voltage theory & application
- National Electric Code (NEC)
- Electrical equipment & circuits
- Permissibility of electrical equipment
- Surface high voltage lines/transformers
- Trailing cables
- Electrical conductors & protection of power conductors for mobile equipment
- Circuit overload protection
- Controls and switches
- Electrical connections & resistor grids
- Grounding systems

WHEN

90-Hour Electrical Certification, 9.0 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9014)	January 15-19,22-26 & 29
Seminar #(96-9154)	May 6-10, 13-17 & 20

COST: $695 per participant.

ANNUAL REFRESHER

WHO SHOULD ATTEND?

Any person who has completed the initial 24-hour Mine Safety and Health Newly Employed Miner training and must complete 8 hours of annual refresher training.

SEMINAR TOPICS

- Statutory rights of miners
- Self-rescue & respiratory devices
- Transportation controls & communications systems
- Introduction to the work environment
- Escape and emergency evacuation plans
- Fire warning & firefighting
- Ground control
- Health
- Hazardous recognition
- Electrical & energy source hazards
- First aid
- Health & safety aspects

WHEN

Annual Refresher, 8-hour Seminar, 0.8 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9149)	Wednesday, February 14
Seminar #(96-9150)	Wednesday, March 20
Seminar #(96-9151)	Wednesday, April 17
Seminar #(96-9152)	Wednesday, May 15
Seminar #(96-9153)	Wednesday, June 12

COST: $60 per participant.

ELECTRICAL ANNUAL REFRESHER

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in the **one-day seminar, Mine Safety and Health Electrical Annual Refresher.** This seminar is required by the Mine Safety and Health Administration (MSHA).

WHO SHOULD ATTEND?

Any person with an Mine Safety and Health Administration (MSHA) electrical certification who must complete 8-hours of electrical annual refresher training.

WHEN

Electrical Annual Refresher, 8-hour Seminar, 0.8 CEUs, 9 a.m. - 5 p.m.

Seminar # (97-9001)	Wednesday, September 11
Seminar # (97-9002)	Wednesday, October 2
Seminar # (97-9003)	Wednesday, November 13
Seminar # (97-9004)	Wednesday, December 11

COST: $60 per participant.

NEWLY EMPLOYED MINER—EXPERIENCED

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **one-day seminar for the Newly Employed Miner - Experienced, or a three-day seminar on Mine Safety and Health for the Newly Employed Miner - Inexperienced.** These seminars are required by the Mine Safety and Health Administration (MSHA).

WHO SHOULD ATTEND?

Any newly employed person that is experienced in their career field and required to work at a mine site.

SEMINAR TOPICS

- Introduction to the work environment
- Mandatory health & safety standards
- Authority and responsibility of supervisors & miner's representatives
- Transportation controls & communication systems
- Escape & emergency evacuation plans; fire warning & firefighting
- Ground controls; working in areas of highwalls, water hazards, pits & spoil banks; illumination & night work
- Hazard recognition

WHEN

Experienced, 6-hour seminar, 0.6 CEUs, 9 a.m. - 3 p.m.

Seminar #(96-9157)	Wednesday, February 14
Seminar #(96-9158)	Wednesday, March 20
Seminar #(96-9159)	Wednesday, April 17
Seminar #(96-9160)	Wednesday, May 15
Seminar #(96-9161)	Wednesday, June 12

COST: $60 per participant.

NEWLY EMPLOYED MINER–INEXPERIENCED

WHO SHOULD ATTEND?

Any newly employed person that is required to work at a mine site.

SEMINAR TOPICS

- Statutory rights of miners
- Self-rescue & respiratory devices
- Transportation controls & communication systems
- Introduction to the work environment
- Escape & emergency evacuation plans
- Fire warning & firefighting
- Ground control
- Health
- Hazardous recognition
- Electrical & energy source hazards
- First aid
- Health & safety aspects
- Hazardous recognition
- Electrical & energy source hazards
- First aid

WHEN

Inexperienced, 24-hour seminar, 2.4 CEUs, 9 a.m. - 5 p.m.

Seminar #(96-9155)	Tues. - Thurs., March 26-28
Seminar #(96-9156)	Tues. - Thurs., June 25-27

COST: $150 per participant.

TRAIN-THE-TRAINER

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **three-day seminar on Mine Safety and Health Train-The-Trainer Seminar.** This seminar is required by the Mine Safety and Health Administration (MSHA) for instructors.

WHO SHOULD ATTEND?

Any person who wants to become an instructor for Mine Safety and Health Administration (MSHA) courses.

SEMINAR TOPICS

- Analyze training requirements
- Writing training objectives
- Outlining a training plan
- Preparing a training plan
- Developing presentation skills

WHEN

Train-The-Trainer, 24-hour seminar 2.4 CEUs, 9 a.m. - 5 p.m.

Seminar #(96-9148)	Tues. - Thurs., August 6-8

COST: $245 per participant.

OPTICS SEMINARS

FUNDAMENTAL PRINCIPLES OF OPTICS

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to attend a **40-hour seminar on Fundamental Principles of Optics.** This intense five-day seminar includes theory and 50 percent hands-on exercises in the labs of Laser Electro-Optics Technology. Seminar participants will receive textbooks. Participants will be required to bring their own scientific calculator and must have a working knowledge of basic algebra and trigonometry.

WHO SHOULD ATTEND?

Inspectors, quality assurance personnel and supervisors

SEMINAR TOPICS

- Introduction to the fundamental principles of optics
- Optical tables & benches
- Windows
- Mirrors, flats & etalons
- Filters & beam splitters
- Reflection at plane & spherical surfaces
- Refraction at plane surfaces
- Prisms
- Refraction at spherical surfaces
- Lenses
- Imaging with simple & multiple lenses
- F-stops & apertures
- Optical systems
- Gratings
- Polarizers

WHEN

Fundamentals Principles of Optics

40-hour seminar, 4.0 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9181)	Mon. - Fri., February 26-March 1
Seminar #(96-9182)	Mon. - Fri., May 20-24

Pre-registration is required two-weeks before seminar.

COST: $495 per participant.

OPTICAL TOOLING SEMINAR

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in an **80-hour seminar on Optical Tooling.** This ten-day seminar includes theory and hands-on lab exercises. Participants will become familiar with the descriptive characteristics, principles, basic instrument usages, and calibration verification procedures of optical tooling and optical quality testing.

WHO SHOULD ATTEND?

Inspectors, quality assurance personnel and supervisors

PREREQUISITE

Participants must have no serious visual defects, particularly astigmatism that could result in inaccurate reading of optical instruments. A knowledge of mathematics through geometry is required.

WHEN

Optical Tooling, 80-hour seminar, 8.0 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9183)	Mon. - Fri., March 18-29
Seminar #(96-9184)	Mon. - Fri., June 10-21

Pre-registration is required two-weeks before seminar.

COURSE LENGTH: Ten 8-Hour days for a two-week period.

COST: $695 per participant.

FIBER OPTICS WORKSHOP

INTRODUCTION

Any Campus USA's Seminars & Workshops invites you to participate in a **40-hour workshop on Fiber Optics**. This workshop is designed give the participant a working knowledge and a basic understanding of the use, installation fabrication, basic design, and components of the fiber optic systems. This workshop includes numerous hands-on laboratory exercises to reinforce the learning process.

WHO SHOULD ATTEND?

Technicians who work with fiber optic cables or those who want a working knowledge of fiber optics.

WORKSHOP TOPICS

- Introduction to fiber optics
- The properties of light
- Optical fiber
- Characteristics of fiber optics
- Fiber optic cables
- Applications for fiber optics

WHEN

Fiber Optics, 40-hour workshop, 4.0 CEUs, 8 a.m. - 5 p.m.

Workshop #(96-9185)	Mon.-Fri., March 4-8
Workshop #(96-9186)	Mon.-Fri., June 3-7

Pre-registration is required two weeks before seminar.
COST: $495 per participant.

WELDING SEMINARS

INTRODUCTION

ny Campus USA's Seminars & Workshops invites you to participate in a **36-hour seminar for Certified Welding Inspector Test Preparation.** This seminar is designed to prepare the participant for the American Welding Society's (AWS) Certified Welding Inspector (CWI) examination.

The **8-hour seminar on Flux Core Metal Arc Welding (FCAW)**. **Gas Metal Arc Welding (GMAW/MIG)** and **Gas Tungsten Arc Welding (GTAW/TIG)** are designed to help the participant maximize the productivity of welding processes.

The **32-hour seminar on Introduction To Welding Equipment Troubleshooting and Repair** is designed to introduce maintenance personnel and supervisors, who have responsibility for welding equipment, to the specifics of welding equipment troubleshooting repair.

The **8-hour seminar on Welding Safety** is designed for the participant to be able to use various welding and cutting processes in a manner which is in compliance with OSHA standards, and to recognize safe and unsafe practices.

WHO SHOULD ATTEND?

Welders, technicians, engineers, inspectors, supervisors, foremen, quality control and assurance personnel who are involved with the welding processes.

CERTIFIED WELDING INSPECTOR (CWI) TEST PREPARATION

SEMINAR TOPICS

- Qualification of the welding inspector
- Welding, brazing and cutting processes
- Terminology of welds, weld joints
- Discontinuities
- Non destructive testing
- Destructive testing
- Welding & non-destructive testing symbols
- Classification of metals
- Weldability of materials
- Review of API Standard 1104
- Quality assurance
- Quality control
- Metric conversion

WHEN

Certified Welding Inspector (CWI) Test Preparation
36-hour seminar, 3.6 CEUs

Seminar #(96-9162)	Mon. - Fri., January 15-19
Seminar #(96-9163)	Mon. - Fri., March 11-15
Seminar #(96-9164)	Mon. - Fri., May 13-17

COST: $400 per participant. Minimum of 10 participants required.

Seminar Training Times:	Monday, 1 - 6 p.m. Tues. - Thur., 8 a.m. - 6 p.m. Friday, 8 a.m. - noon

FLUX CORE ARC WELDING

SEMINAR TOPICS

- Introduction to flux core arc welding (FCAW)
- Process equipment & setup
- Gasless flux core arc welding
- How to set the machine for optimum production
- How to control bead appearance
- What the American Welding Society (AWS) Structural Welding Code D1.1 says about FCAW
- How to develop and improve your welding procedures

WHEN

Flux Core Arc Welding, 8-hour seminar, 0.8 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9167)	Wednesday, February 7
Seminar #(96-9168)	Wednesday, April 3
Seminar #(96-9169)	Wednesday, June 5

COST: $95 per participant.

GAS METAL ARC WELDING

SEMINAR TOPICS

- Introduction to gas metal arc welding (GMAW/MIG)
- Process equipment & setup
- The three types of metal transfer and when to use each
- How to set the machine for optimum production
- How to control bead appearance
- What the American Welding Society's (AWS) Structural Welding Code D1.1 says about GMAN/MIG processes
- How to develop and improve welding procedures

WHEN

Gas Metal Arc Welding, 8-hour seminar, 0.8 CEUs, 8 a.m. - 5 p.m.

Seminar# (96-9170)	Wednesday, February 14
Seminar #(96-9171)	Wednesday, April 10
Seminar #(96-9172)	Wednesday, June 12

COST: $95 per participant

GAS TUNGSTEN ARC WELDING

SEMINAR TOPICS

- Introduction to Gas Tungsten Arc Welding (GTAW/TIG)
- Process equipment & setup
- How to set up to weld various metals including stainless steel, aluminum & magnesium
- How to set the Machine for optimum production
- How to control bead appearance
- What the American Welding Society Mechanical Engineer (ASME) Boiler & Pressure Vessel Code says about GTAW/TIG
- How to develop and improve your welding procedures

WHEN

Gas Tungsten Arc Welding, 8-hour seminar, 0.8 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9173)	Wednesday, March 6
Seminar #(96-9174)	Wednesday, May 1
Seminar #(96-9175)	Wednesday, July 10

COST: $95 per participant.

INTRODUCTION TO WELDING EQUIPMENT TROUBLESHOOTING & REPAIR

SEMINAR TOPICS

- Review of the major arc welding processes
- Troubleshooting shielded metal arc welding equipment
- Troubleshooting flux core arc welding equipment
- Troubleshooting gas metal arc welding equipment
- Troubleshooting gas tungsten arc welding equipment
- Troubleshooting submerged arc welding equipment

WHEN

Introduction To Welding Equipment Troubleshooting & Repair
32-hour seminar, 3.2 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9165)	Mon.-Thurs., February 26-29
Seminar #(96-9166)	Tues.-Fri., May 28-31

COST: $395 per participant.

WELDING SAFETY

SEMINAR TOPICS

- Introduction to welding & cutting processes
- Introduction to welding & cutting Safety
- Hazards
- Preventive & protective measures
- Arc welding safety
- Fire prevention
- Hearing protection
- Respiratory protection
- OSHA safety standards for welding and cutting
- 1926.350 gas welding & cutting
- 1926.351 arc welding & cutting
- 1926.352 fire prevention
- 1926.353 ventilation & protection in welding, cutting & heating
- 1926.354 welding, cutting and heating in way of preservative coatings

WHEN

Welding Safety, 8-hour seminar, 0.8 CEUs, 8 a.m. - 5 p.m.

Seminar #(96-9176)	Wednesday, March 20
Seminar #(96-9177)	Wednesday, May 8
Seminar #(96-9178)	Wednesday, July 17

COST: $95 per participant.

ENVIRO-SAFE CONFERENCE & EXPO

INTRODUCTION

Any Campus USA invites you to participate in a **3-day Environmental & Safety Conference and Exposition on September 17, 18 & 19 at the Convention Center.** Come and see what's new in '96 and what the future holds for '97 for industry professionals in safety and environmental areas. This conference will include presentations by professional leaders who are experts in safety and environmental fields.

WHO SHOULD ATTEND?

Business persons, engineers, environmental personnel, safety personnel, energy consultants, and other safety and environmental professionals.

WORKSHOPS

- Open forum on September 16, by TNRCC & TWCC
- Generators of Hazardous Waste
- Construction Safety (10 hours- U.S. Dept. of Labor)
- Confined Space/Fall Protection
- Hazard Communications
- Workplace Violence
- Processing Tier II Reports
- Ergonomics
- ISO 9000 & ISO 14000
- Workers' Compensation-Occupational Illnesses & Recordkeeping
- Agricultural Chemical & Equipment Safety-Applicators Licence
- Voluntary OSHA Guidelines
- Bio-Remediation
- Supervisors' Safety Course for Small Businesses
- Blood Borne Pathogens & Other Communicable Diseases
- Radon
- Low-Level Radioactive Waste-Scrap Metal Industry
- Environmental Liability
- Alternative Fuels
- HAZWOPER Refresher - 8 hours
- And many offering CEUs and certificates for all workshops

A booklet of class schedules will be forthcoming in the Spring of 1996.

ATTENTION ATTENDEES

EARLY REGISTRATION ENDS APRIL 1

- Fee includes all presentations, lunches, breaks, seminars and materials
- Cancellation & refund no later than August 1

ATTENTION EXHIBITORS

- Late registration fee per booth $50
- Set up: September 16 — 1 to 10 p.m.
- One full conference pass to all exhibits
- Unlimited exhibit hall passes

CANCELLATION AND REFUND NO LATER THAN AUGUST 1

For more information or to reserve a space call __________

AREAS OF TRAINING EXPERTISE

- Air Conditioning & Refrigeration
- Aircraft Pilot Training
- Asbestos
- Audio Visual Production
- Auto Collision & Repair
- Automated Manufacturing
- Automated Office
- Automotive Technology
- Aviation Maintenance
- Aviation Structures
- Avionics
- Biomedical Equipment
- Building Construction
- Business & Management
- Chemical Technology
- Commercial Art & Advertising
- Computer Networking and Systems Administration
- Computer Systems/Networking
- Computer Science
- Dental Assistant
- Diesel Mechanics
- Electrical Systems Technology
- Electronic Servicing
- Electronic Technology
- Emergency Medical/Paramedics
- Environmental
- Fiber Optics
- Food Service/Culinary Arts
- Golf Course & Turf Grass Management
- Graphic Imaging Systems
- Hazardous Materials Management
- Heavy Truck & Construction Equipment
- Industrial Maintenance Mechanics
- Industrial Management
- Instrumentation
- Interior Design
- ISO 9000
- Laser Electro-Optics
- Laser Safety
- Machining
- Manufacturing Engineering Technology
- Meat Processing & Marketing
- Mechanical Engineering Technology
- Mechanical Electrical Technology
- Medical Records Clerk
- Medical Transcription
- Metrology
- Millwright
- Mine Safety & Health Administration (MSHA)
- Nondestructive Evaluation
- Occupational Safety & Health
- Pipefitting
- Plant Engineering
- Plastics Manufacturing
- Professional Truck Operations
- Radiation Protection
- Radio Communication Electronics
- Robotics
- Semiconductor Manufacturing
- Telecommunications
- Television Servicing
- Time Management
- Vacuum Techniques
- Vocational Nursing
- Welding

REGISTRATION

All registration fees are due prior to the start of the seminar. Advance registration guarantees your reservation and eliminates check-in delays. Once your advance registration is complete, we will immediately send you a Confirmation Notification, which will include information about accommodations, a campus map and seminar location.

All seminar fees include handouts, workshop instructions and coffee breaks. Any Campus USA reserves the right to cancel a class if a minimum number of students do not register. Enrollment will be on a first-come, first-serve basis.

Tax Deduction. An income tax deduction may be allowed for education expenses undertaken to maintain or improve professional skills. This includes registration, travel, meals, lodging, etc. Please contact your accountant for complete details.

Cancellation. We understand that circumstances may arise that require you to cancel. If you cancel your registration up to five business days before the seminar, your registration fee will be refunded less a $10 enrollment charge. If your cancellation is received less than five business days before the seminar, you may send a substitute or receive a credit memorandum good for one year toward another seminar of equal value.

SEMINAR INFORMATION

☐ "We have entered into an agreement with the State Board of Public Accountancy to meet the requirements of continuing education rules covering maintenance of attendance records, retention of program outlines, qualifications of instructors, program content, physical facilities, and length of class hours. This agreement does not constitute an endorsement by the Board as to the quality of the program or its contributions to the professional competence of the licensee." Continuing Education Sponsor ID# 06502, Any Campus USA, Seminars/Workshops.

☐ Members of the ANY CAMPUS USA Alumni Association will be eligible for a discount with current identification card.

☐ "Reasonable arrangements for persons with disabilities will be made if requested at least two weeks in advance."

ODGING

Manor House Inn is the host hotel for ANY CAMPUS USA Seminars & Workshops participants. The following information is a list of the amenities offered:

MANOR HOUSE INN

- Continental Breakfast
  Includes: Coffee, orange juice, a variety of cereals, milk, bagels, danishes, and fresh fruits
- Free Local Calls
- City-Wide Shuttle Service
  Complimentary Services Available:
  7:30 a.m. until 10:00 p.m. Monday - Saturday
  7:30 a.m. until 4:00 p.m. Sunday
- Free Golf at the Country Club
- On-Site Sports Grill
- Large Outdoor Pool
- Finest Hospitality!

Manor House Inn offers a special rate of $49.00 for ANY CAMPUS USA training participants. The hotel is conveniently located near shopping centers, restaurants, and movie theaters. Based on availability, reservations can be made by calling 1-800-772-9440.

For Further Information: If you would like to be on the mailing list for Seminar Catalog or the Seminar Monthly Schedules. Please call **SEMINARS & WORKSHOPS**

____

Fax: ____________________

Seminar Registration Form

(Please duplicate for group registration)

YES! I WANT TO ATTEND A SEMINAR/WORKSHOP!

lease enroll me in:

1. Seminar Title:____________________
2. Seminar #:____________________
3. Seminar Date:____________________
4. Seminar Registration Fee:____________________

METHOD OF PAYMENT:

☐ My check or purchase order, made out to Any Campus USA, is enclosed.

☐ Please charge____registration(s) to my credit card. Check one.

☐ ☐ ☐

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 Exp

Cardholder's Name____________________

Signature____________________

Name of Attendees:

1. Mr./Ms.____________________Title:____________________
2. Mr./Ms.____________________Title:____________________
3. Mr./Ms.____________________Title:____________________

Company:____________________

Business Address:____________________City:__________State:_____Zip:_______-_____

Business Phone:___(____)____________________ Business Fax: ___(____)____________________

To register... **Call toll-free** ________________

or FAX the completed registration form to: ________________

or MAIL the form to:
Any Campus USA
Seminars/Workshops

✂ -

Can Any Campus USA help you?

☐ *If you are interested in a particular seminar or workshop that is not listed, please give us a call. If there is a need, we may be able to offer it in the future.*

☐ *If you want an on-site training program, please give us a call.*

☐ *Any Campus USA is charged with facilitating economic development throughout the state by providing a wide range of services and training. Assistance includes assessment of employee training needs, curriculum development, preparation of instructional materials, testing and evaluation of employees, as well as development of training strategies. Specialized contract training in almost every field from welding to laser electro-optics has been offered throughout the state.*

☐ *Training can be provided for New Plant Startup and Plant Expansion, Journeyman Upgrade, Displaced Workers, and Workplace Literacy. Industrial training also encompasses the development of related duty and task inventories and the creation of job descriptions. Descriptions of job-specific written and practical tests for assessing work force skills, determining training needs, testing new hires and career advancement are also provided. Consultation services in engineering, craft or management are a part of the total service of Any Campus USA.*

PLEASE GIVE US A CALL AT ____________________

SEMINARS & WORKSHOPS

NON-PROFIT ORG.
U.S. POSTAGE
PAID
PERMIT NO.

Attention Mailroom Personnel:
If undeliverable as addressed, please reroute to your training director.

YOUR COLLEGE NAME
AND ADDRESS

News

For Immediate Release
Date
Contact: College Marketing & Communication Rep. - Phone Number

YOUR COLLEGE TO HOLD INDUSTRIAL TRAINING SEMINARS/WORKSHOPS

YOUR COLLEGE, in cooperation with *LOCAL INDUSTRY*, is presenting a one-day seminar on *INDUSTRIAL TRAINING TOPIC*. Training will be held on *DATE and TIME*.

The seminar/workshop will include in-depth training in the specific skills which the company has requested. (This could be any one or more of the MAST Remote Site Training Modules.)

The seminar/workshop will be held at *LOCATION* and the *COST* is $$$. Lunch will/will not be provided.

The seminar/workshop is intended for *TARGET PARTICIPANTS*. Participants receive Continuing Education Units (CEUs) and a *YOUR COLLEGE* certificate upon completion of the workshop.

For more information, contact *COLLEGE TRAINING REPRESENTATIVE at Phone Number*.

This paragraph could include some information about *YOUR COLLEGE*. It can serve as a marketing tool for further training. (For example: "*YOUR COLLEGE* is a leading center for industrial/vocational training in the state. With over 40 instructional programs in the most critical technology areas, *YOUR COLLEGE* is preparing a workforce to meet the demands of business and industry. For more information call *COLLEGE Phone Number*."

Figure R-5

APPENDIX - B

Appendix B.....of the MAST Remote Site/Industrial Training Model contains the documentation which is recommended to aid in the planning and implementation of the seminar/workshop or training program.

SEMINARS/WORKSHOP PROCESS DOCUMENT

1. PLANNING
    - Budget, finances
    - Public relations
    - Countdown time line
    - Responsibility plan
    - Mailing lists
    - Seminar training date selection
    - Facilities/food
    - "To do" lists
    - Follow-up report
2. PUBLIC RELATIONS
    - Training policy statement
    - Brochure
    - Catalogs
    - Bulletins/announcements/news releases
    - Electronic mail & electronic bulletin boards
    - Newsletters
    - Audio-visual media
    - Notify college telephone operators
3. FACILITIES
    - Instructional programs
    - Student center
    - Industrial Training Department
    - Others
4. SCHEDULES
    - Master schedule
    - Monthly schedule
    - Weekly schedule
    - Daily seminar agenda
5. REFRESHMENTS & LUNCHES
    - Coffee breaks
    - Lunch facilities
    - Menu
    - Payment
    - Restaurant listings
6. ACCOMMODATIONS
    - On-campus housing
    - Hotel listings
7. REGISTRATION
    - Seminar enrollment form
    - Seminar enrollment confirmation
    - Seminar information brochure
    - Telephone/fax/mail
    - Campus map
8. MAILING LIST
    - Advisory committee members
    - Associations/society members
    - College former students
    - College employees
    - Past seminar participants
    - Industrial training clients

Figure R-6

9. CHECKLISTS
    - Publicity
    - Food
    - Public address equipment
    - Speakers
    - Planning
    - Registration
    - Billing
    - Time sheets
    - Mailing lists
    - Accommodations
    - Visitor literature
    - Audio-visual media
    - Facilities
    - Audio visual equipment
    - Follow-up
    - Schedules
    - Evaluations
    - Letter of Agreement
    - Files
    - Certifications
    - Publication
    - Parking/security/telephone operator

10. LETTER OF AGREEMENT
    - Letter of Agreement with instructor

11. TIME SHEET & PAYROLL
    - Time sheet form
    - Payroll verification

12. FILES
    - Planning
    - Clients
    - Mailing lists
    - Resumes/biography
    - Seminar registration fee credit
    - Schedules
    - Marketing
    - Consultants
    - Seminar attendance roster
    - Registration deposits
    - General information (budget, facilities, insurance, personnel, etc.)
    - Courses (objectives, topic outlines, lessons, evaluation)

13. PUBLICATIONS
    - Participant workbook
    - Handbooks
    - Manuals
    - Audio cassettes
    - Videocassettes
    - Video-base instruction system

14. VISITOR LITERATURE
    - City tourist package
    - College package
    - Industrial training package
    - Seminar brochures
    - Seminar catalogs

15. INVOICING
    - Course attendance check
    - Invoicing records

16. PARKING/SECURITY/TELEPHONE OPERATOR
    - Notify security about seminar
    - Parking permits for participants
    - Notify telephone operators

17. CERTIFICATES
    - Course registration information
    - Certificate form

18. EVALUATION
    - Seminar evaluation form
    - Instructor's evaluation of the course
    - Director's narrative report

19. CONDUCT SEMINAR
    - Registration
    - Receipt of fees
    - Name badges
    - Desk name cards
    - Check refreshments
    - Check facilities
    - Check audio visual equipment
    - Distribute seminar handout/booklet

20. FOLLOW-UP
    - Prepare & send list of attendees to all attendees
    - Thank speakers and other key participants
    - Pay final bills
    - Synthesize evaluation comments and other feedback
    - Prepare a brief narrative report for the file
    - Record attendance data
    - Verify payment of instructor

SEMINARS/WORKSHOP PERSONNEL

1. MANAGEMENT
    - Budget, finances
    - Registration
    - Evaluation
    - Public relations
    - Message center
    - Correspondence
    - Recruit instructors for seminars
    - Market new seminars
    - Schedule deadlines
    - Mailing lists
    - Planning
    - Letter of Agreement

2. PROGRAM
    - Schedule plan
    - Seminar content/topic outline
    - Seminar booklet
    - Exhibits
    - Certificates
    - Registration at seminar's first day
    - Seminar name/desk tags
    - Seminar attendance roster
    - Seminar checklist finalize

3. FACILITIES/FOOD/ACCOMMODATIONS
    - Meeting rooms
    - Meals, coffee breaks
    - Accommodations
    - Parking/security/telephone operators
    - Transportation
    - Message center

4. CLERICAL SUPPORT
    - Seminar registration
    - Telephone
    - FAX
    - Mail
    - Receptionist
    - Reservationist
    - Confirmations
    - Files
    - Mailing lists
    - Invoicing
    - Typing
    - Computer specialist
    - Certificates
    - Seminar registration fee credit
    - Messages
    - Public relations

Figure R-7

SEMINAR COUNTDOWN TIME LINE

PLANNING ACTIVITIES

EIGHTH WEEK

___ 1. Determine sponsor
___ 2. Choose title
___ 3. Identify instructor
___ 4. Identify objectives
___ 5. Identify audience
___ 6. Estimate expected audience attendance
___ 7. Determine seminar date
___ 8. Estimate registration fee
___ 9. Determine start & ending time
___ 10. Determine breaks & lunch periods
___ 11. Is lunch included in registration fee?
___ 12. Choose training facilities
___ 13. Any special requests
___ 14. Prepare a preliminary agenda
___ 15. Determine seminar responsibility plan

SEVENTH WEEK

___ 16. Contact instructor
___ 17. Determine publication needs
___ 18. Determine audio visual needs
___ 19. Get mailing list
___ 20. Finalize agenda
___ 21. Prepare a biography on instructor(s)
___ 22. Finalize registration fee
___ 23. Prepare a brochure

SIXTH WEEK

___ 24. Prepare a Letter of Agreement
___ 25. Schedule seminar into master training schedule
___ 26. Prepare final program schedule & agenda
___ 27. Finalize brochure
___ 28. Arrange for coffee breaks & lunches
___ 29. Print mailing labels
___ 30. Mail out brochure
___ 31. Send final agenda & brochure to instructor

FIFTH WEEK

___ 32. Release media announcements
___ 33. Receive registrations

Figure R-8

___ 34. Mail out confirmations
___ 35. Notify public safety & telephone operators
___ 36. Prepare any booklet or handouts
___ 37. Review enrollment data

FOURTH WEEK

___ 38. Receive registrations
___ 39. Mail out confirmations
___ 40. Review seminar plans with instructor
___ 41. Show instructor facilities
___ 42. Determine all room set-ups
___ 43. Review instructor's classroom needs
___ 44. Review seminar responsibilities with staff
___ 45. Review enrollment data
___ 46. Review checklist

THIRD WEEK

___ 47. Receive registrations
___ 48. Mail out confirmations
___ 49. Generate seminar roster
___ 50. Confirm count for breaks & lunch
___ 51. Establish sigh-in procedures
___ 52. Review enrollment data
___ 53. Review checklist

SECOND WEEK

___ 54. Receive registrations
___ 55. Mail out confirmations
___ 56. Design & print evaluation forms
___ 57. Verify/confirm facilities usage
___ 58. Confirm seminar with public safety & telephone operators
___ 59. Update seminar roster
___ 60. Print participant name tags
___ 61. Review enrollment data
___ 62. Review checklist

FIRST WEEK

___ 63. Receive registrations
___ 64. Mail out confirmations
___ 65. Update seminar roster
___ 66. Prepare seminar packages
___ 67. Verify instructor & materials
___ 68. Finalize instructor package
___ 69. Finalize booklet or handouts
___ 70. Review enrollment data
___ 71. Review all checklist

SEMINAR WEEK

___ 72. Receive registrations
___ 73. Telephone/fax confirmations
___ 74. Finalize seminar roster
___ 75. Review enrollment data
___ 76. Confirm checklists are complete
___ 77. Distribute seminar package
___ 78. Distribute College literature
___ 79. Distribute city visitor literature
___ 80. Media coverage
___ 81. Seminar registration process
___ 82. Collect seminar registration fees
___ 83. Collect evaluations
___ 84. Prepare a seminar follow-up report

REQUEST FROM BUSINESS AND INDUSTRY

No.________

DATE:________________

NAME:____

TITLE:____

COMPANY:____

MAILING ADDRESS:______________________________________

CITY:____________________STATE:______________ZIP:________

PHONE#: (______)____________________ FAX#: (______)______________

INTERESTS AND COMMENTS:____

INITIAL CONTACT:______________________

ASSIGNED TO:__________________________

APPOINTMENT: LOCATION:______________

DATE:____________ TIME:______________

Figure R-9

SEMINAR REGISTRATION FORM

(Please duplicate for group registrations)

YES! I WANT TO ATTEND A SEMINAR/WORKSHOP!

Please enroll me in:

1. Seminar Title:______________________________________

2. Seminar #:____________________ 3. Seminar Date: ______________

4. Seminar Registration Fee:__________ 5. Campus Housing:___Nights@$20.=_________

Name of Attendees:

1. Mr./Ms. ______________________________Title:________________

2. Mr./Ms. ______________________________Title:________________

3. Mr./Ms. ______________________________Title:________________

Company: ____

Business Address:____________________City:___________State:___Zip___________

Business Phone: (____)_______________Business Fax: (____)_______________

Method of Payment:

____My check or purchase order, made out to YOUR COLLEGE, is enclosed.

____Please charge ____ registration(s) to my credit card. Check one.

____ Master Card ____ VISA ____ Other (specify)________________

☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	■	☐	☐	☐
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		Exp.Date		

Cardholder's Name______________________Signature______________________

To register*...Call* toll-free
1-800-__________
or (__)__Phone #___

or ***FAX*** the completed
registration form to:
(__)__FAX #______

or ***MAIL*** the form to:
COLLEGE NAME
College Address

- -

Can OUR COLLEGE help you?

___ *If you are interested in a particular seminar or workshop that is not listed, please give us a call. If there is a need, we may be able to offer it in the future.*

___ *If you want an on-site training program, please give us a call.*

___ *If you need assistance with assessing employee training needs, curriculum development, preparation of instructional materials, testing and evaluation of employees as well as developing training strategies. Specialized contract training in almost every field has been offered.*

___ *Training can be provided for New Plant Startup, Plant Expansion, Journeyman Upgrade, Displaced Workers, and Workplace Literacy.*

___ *Consultation services are available to develop related duty/task inventories and job description creation. Testing of new hires, assessing work force skills and career advancement are also provided.*

PLEASE GIVE US A CALL AT 1-800-YOUR COLLEGE

Figure R-10

SEMINAR & WORKSHOP
ENROLLMENT CONFIRMATION

Name of Enrolled Trainee:____________________________________

Seminar(s) Enrolled In:____________________________________

____

Daily Times:____________________________________

Seminar Location:____________________________________

Please retain this enrollment notice and present it on the first day of the seminar class.

___ Seminar Cancelled
(If a seminar is not held for ANY reason, the
college's liability is limited to the seminar fee.)

___ Seminar Rescheduled
Date:__________________

If you cannot attend this seminar, please notify the Seminars & Workshop department at least 10 days before the seminar is due to begin. The full tuition fee will be refunded less a $10 processing fee. Otherwise, the full payment will be converted to a non-refundable credit which can be applied toward any seminar up to one full year.

Trainee substitutions are permissible provided the substitute trainee has met the seminar prerequisites.

Continuing Education Units (CEUs) will be issued to each trainee upon successful completion of the seminar.

Certified Public Accountant (CPA) attendance forms are available for record of satisfactory completion of the Continuing Education credit applicable to the State Board of Public Accountancy.

The expense of continuing education, when taken to maintain and improve professional skills, is tax deductible. Please contact your accountant for complete details.

If you have any questions, please contact the college representative
COLLEGE NAME, ADDRESS AND PHONE

Thank you for your interest in our Seminars & Workshops!

Figure R-11

SAMPLE HOTEL/MOTEL ACCOMODATIONS

WACO, TEXAS
HOTEL/MOTEL ACCOMODATIONS

COURTESY OF THE WACO CONVENTION & VISITORS BUREAU
1-800-WACO-FUN/ 1-800-922-6386 In local area: (817) 750-8696

1. NEW ROAD INN
4908 IH-35
Waco, TX 76704
(817) 662-2442
52 rooms

2. BEST FOR LESS MOTEL
3812 I-35
Waco, TX 76706
(817) 662-2220
50 rooms

3. THUNDERBIRD MOTEL
3824 S. I-35
Waco, TX 76706
(817) 662-2820
25 rooms

4. ASTRO MOTEL
3416 LaSalle Ave
Waco, TX 76706
(817) 662-2000
50 rooms

5. MARDI GRAS
1801 Valley Mills Dr
Waco, TX 76711
(817) 756-3774
42 rooms

6. MOTEL 6
3120 N. I-35
Waco, TX 76704
(817) 662-4622
143 rooms

7. LONE STAR MOTEL
2428 LaSalle
Waco, TX 76706
(817) 753-1535
30 rooms

8. BUDGET INN
1700 I-35
Waco, TX 76706
(817) 754-2461
28 rooms

9. COMFORT INN
1430 S. I-35
Waco, TX 76706
(817) 752-1991
(800) 553-2000
54 rooms

10. SUPER 8 MOTEL
1320 S I-35
Waco, TX 76706
(817) 754-1023
75 rooms

11. THORNTON'S BED AND BREAKFAST
905 Speight Ave
Waco, TX 76706
(817) 756-0273
5 rooms

12. LA QUINTA INN
1110 South 9th Street
Waco, TX 76704
(817) 752-9741
(800) 531-5900
102 rooms

13. QUALITY INN
801 S. 4th St
Waco, TX 76706
(817) 757-2000
(800) 275-5235
148 rooms

14. BEST WESTERN OLD MAIN LODGE
4th Street and I-35
Waco, TX 76703
(817) 753-0316
(800) 528-1234
84 rooms

15. LEXINGTON INN
115 IH-35
Waco, TX 76705
(817) 754-1266
(800) 53 SUITE
112 rooms

16. HILTON INN
113 S. Univ. Parks Dr
Waco, TX 76701
(817) 754-8484
(800) 234-5244
199 rooms

17. RIVERPLACE INN
101 N. I-35
Waco, TX 76704
(817) 752-0222
(800) 792-3267
96 rooms

18. HOLIDAY INN
1801 Martin Luther King Dr
(formerly Lake Brazos Dr)
Waco, TX 76704
(817) 753-0261
(800) HOLIDAY
171 rooms

19. VICTORIAN INN
720 Martin Luther King Dr
(formerly Lake Brazos Dr)
Waco, TX 76704
(817) 753-3200
(800) 528-1629
30 rooms

20. ECONO LODGE
500 E. I-35
Waco, TX 76705
(817) 756-5371
44 rooms

21. OLD HICKORY
1204 S. Loop Drive
Waco, TX 76704
(817) 756-4112
26 rooms

22. VIKING INN
1200 New Dallas Hwy
Waco, TX 76705
(817) 799-2414
46 rooms

23. UPTOWN MOTEL
620 N. 5th St
Waco, TX 76701
(817) 753-3321
25 rooms

24. OAKLODGE MOTOR INN
1024 Austin Ave
Waco, TX 76701
(817) 756-7818
76 rooms

25. VILLA CAPRI MOTEL
2529 Franklin Ave
Waco, TX 76710
(817) 754-4353
37 rooms

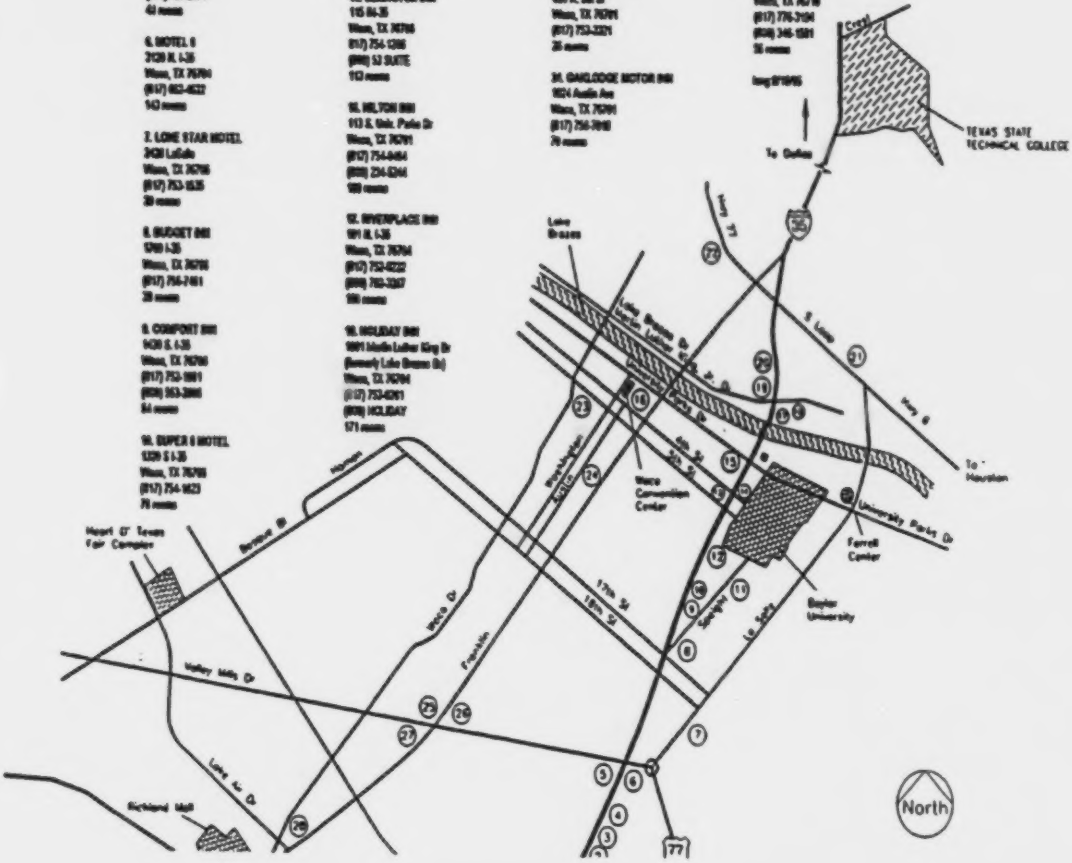
26. SANDMAN MOTEL
3820 Franklin Ave
Waco, TX 76710
(817) 756-3791
53 rooms

27. MANOR HOUSE INN
4201 Franklin Avenue
Waco, TX 76710
(817) 772-9440
(800) 772-9440
121 rooms

28. AMERICAN INN
4900 W. Waco Dr
Waco, TX 76710
(817) 772-2110
44 rooms

29. BEST WESTERN WACO MALL
6624 W. Hwy 84
Waco, TX 76710
(817) 776-3194
(800) 346-1581
56 rooms

hmg 8/19/95


Crest
TEXAS STATE TECHNICAL COLLEGE
To Dallas
35
Loop 340
Lake Brazos
Lake Brazos Dr
Martin Luther King Jr Dr
Loop
Hwy 6
To Houston
4th St
5th St
Washington
Austin
Waco Convention Center
University Parks Dr
Farrell Center
Baylor University
17th St
18th St
Speight
La Salle
Herring
Sanger
Heart O' Texas Fair Complex
Valley Mills Dr
Waco Dr
Franklin
Lake Air Dr
Richland Mall
77
North
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29

Figure R-12

BEST COPY AVAILABLE

FACILITY RESERVATION FORM

Date Confirmed: ________ Tentative ☐

NAME: ____________________ PHONE: ____________

DEPARTMENT/ORGANIZATION: ____________________

ADDRESS: ____________________

____
(City) (State) (Zip)

TSTC CONTACT: ____________________

TYPE OF FUNCTION: ____________________

ESTIMATED ATTENDANCE: ____________ DATE & TIME: ____________

FACILITY ARRANGEMENTS

ROOM CONFIGURATION: (see examples on reverse side)

- ___ Theater (seats 125 maximum)
- ___ U-Shape (outside seating) (seats 30 maximum)
- ___ Classroom (with tables) (seats 70 maximum)

MICROPHONE:

___ On Lectum ___ Hand Held ___ Lavaliere (clip-on)

AUDIOVISUAL MATERIALS:

- ___ Satellite Downlink
- ___ Video Monitor
- ___ Flipchart & Stand
- ___ Overhead Projector & Screen
- ___ Slide Projector & Screen

INSTRUCTIONS AND/OR OTHER NEEDS:

IF THE ARRANGEMENTS INDICATED ON THIS FORM AND THE POLICIES OF THE IDEAS CENTER MEET WITH YOUR APPROVAL, PLEASE SIGN AND RETURN THIS AGREEMENT. THE IDEAS CENTER WILL ENTER YOUR FUNCTION IN OUR RECORDS ON A CONFIRMED BASIS.

I hereby approve the arrangements as shown and fully understand the IDEAS Center policies as stated on the reverse side of this form.

Figure R-13

- The IDEAS Center is a designated non-smoking area.

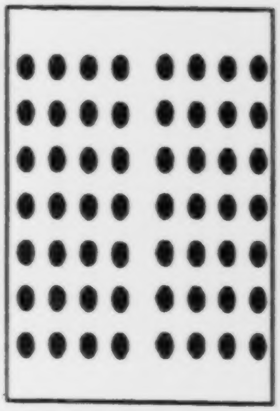
  We will provide a technician to operate the satellite, VCR, monitors, and microphone system.

- Acquisition of equipment that the IDEAS Center does not have available will be the responsibility of the person(s) reserving the room.

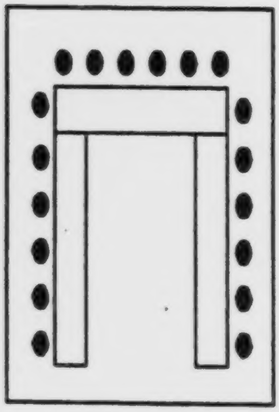
- To ensure the best possible service, final confirmation of the reservation must be made one week prior to the event by the requester.

- All copyright procedures must be adhered to during satellite downlinking.

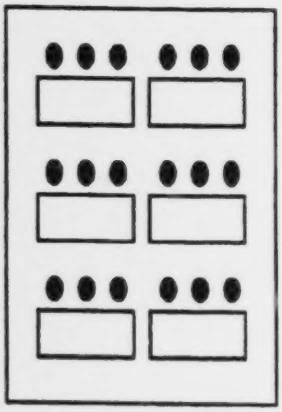
EXAMPLES OF ROOM CONFIGURATIONS



Theater Style

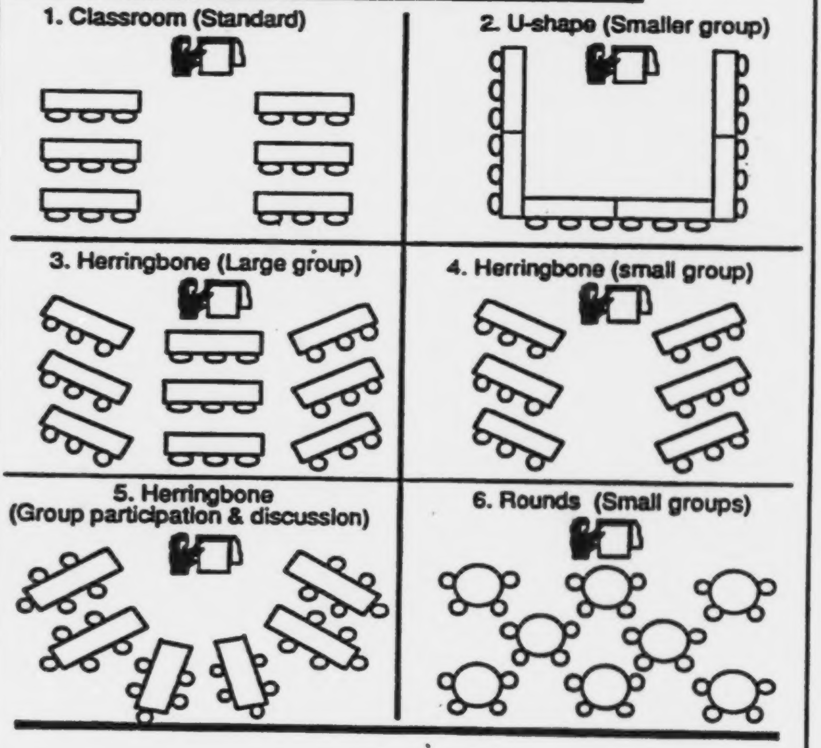


U-Shape Style



Classroom Style

Alternative room layouts


1. Classroom (Standard)
2. U-shape (Smaller group)
3. Herringbone (Large group)
4. Herringbone (small group)
5. Herringbone
(Group participation & discussion)
6. Rounds (Small groups)

NOTES:____

REFRESHMENT / LUNCH
ARRANGEMENT FORM

INSTRUCTOR:______________________________ FUNCTION:__________________

ORGANIZATION:___________________________ HOST(ESS):_________________

DATE OF FUNCTION:_____________________ TIME OF FUNCTION: _________

NUMBER OF GUESTS:____________________ TYPE OF SERVICE: __________

PRICE: $____________ per person HEADTABLE: _______________

BILL TO: ____

____

MENU:

SPECIAL SERVICE REQUEST(S):____

____

____

PERSON TAKING CALL:____

DATE & TIME OF CALL: ____

Figure R-14

SEMINAR CLASS ENROLLMENT

Seminar Name:				**Seminar Number**
Name (Last, First, Middle Initial)				**Social Security #**
Home Address	**City**	**State**	**Zip**	**Home Phone** ( )
Employer (Company Name)				**Business Phone** ( )
Employer Address	**City**	**State**	**Zip**	**Business Fax** ( )
Marital Status (Optional) _______ Single _______ Married		**Sex (Optional)** _______ Male _______ Female		
Ethnic Group (Optional) ____ American Indian Alaskan ____ Asian/ Pacific Is. ____ Black ____ Hispanic ____ White				

Signature of Student

Date

Three Methods to Register:

- **Mail Completed Form to:**
- **FAX Completed Form to:**
- **Telephone**

[redacted]

Would you like information on other seminars we will be offering?

☐ **Yes** ☐ **No**

What other seminar subjects would you be interested in?

____

For Office Use Only			
Receipt # __________	**Check #** __________	**Amount $** ______________	**Confirmation #** ______________

Figure R-15

BEST COPY AVAILABLE

SEMINAR ROSTER

SEMINAR TITLE: ______________________ SEMINAR NO.: __________

BEGIN DATE: __________ END DATE: __________ INSTRUCTOR: __________

DAY: __________ TIME: __________ TOTAL HOURS: __________

BLDG/ROOM: ______________________ COST: __________

MINIMUM: __________ MAXIMUM: __________

	NAME	PHONE #	NOTES	RECEIPT
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				

Figure R-16

CLASS ATTENDANCE RECORD

CLASS: ______________________________

DATE(S): ______________________________

INSTRUCTOR: ______________________________

	NAME	MON	TUE	WED	THUR	FRI
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
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16.						
17.						
18.						
19.						
20.						
21.						
22.						
23.						

Figure R-17

SEMINAR & WORKSHOP EVALUATION

Date:____________________

Name of Seminar: ____

Name of Instructor:____

The purpose of this evaluation is to give the instructor the benefit of the opinions that you have formed during your participation in this seminar. You can help maintain a high quality of instruction by completing this evaluation. Please indicate your best judgement for each item by circling the number.

		HIGH				LOW
1.	Preparation and organization	5	4	3	2	1
2.	Knowledge and skills of subject	5	4	3	2	1
3.	Instruction and communications	5	4	3	2	1
4.	Control and direction of class	5	4	3	2	1
5.	Instructor's willingness to help	5	4	3	2	1
6.	Suitability of training materials	5	4	3	2	1
7.	Equipment condition	5	4	3	2	1
8.	Classroom/lab condition	5	4	3	2	1
9.	Attainment of specified objectives	5	4	3	2	1
10.	Overall opion of the seminar	5	4	3	2	1

COMMENTS: (Likes, dislikes, changes, or other suggestions)

____

____

(use back for additional comments)

How did you hear about this seminar?

___ Brochure

___ TV

___ Seminar catalog

___ Radio

___ Employer

___ Relative

___ Newspaper (please specify)______________________________

___ Other (please specify) ______________________________

Thank you for completing this evaluation.

Figure R-18a

COURSE EVALUATION

Date: ____________________

Name of Seminar: ____

Name of Instructor: ____

To the Participant: You can help the instructor improve this course by completing this evaluation. Please consider the following items and circle the number provided for varying responses. If you have suggestions or comments, write them in the spaces provided. **Do Not Sign Your Name.**

4 = Very Good 3 = Good 2 = Adequate 1 = Needs Improvement

INSTRUCTOR SKILLS

1. The preparation and organization of the instructor's lesson was 4 3 2 1
2. The instructor's mastery of the subject was 4 3 2 1
3. The instructor's enthusiasm about the subject was 4 3 2 1
4. The clarity of the instructor's speech was 4 3 2 1
5. The instructor's communication of the subject matter was 4 3 2 1
6. The instructor's ability to arouse interest and enthusiasm of the participants was 4 3 2 1
7. The instructor's clear explanation of course material was 4 3 2 1
8. The instructor's manners; such as being easy to approach, courteous and welcoming difference of opinion were 4 3 2 1
9. The instructor's ability to control the direction of the class was 4 3 2 1
10. The monitoring of the student/s performance and necessary guidance by the instructor was 4 3 2 1
11. The encouragement of student participation by the instructor was 4 3 2 1
12. The time allowed for questions by the instructor was 4 3 2 1
13. In general, the instructor's instructional skills were 4 3 2 1

Comments: ____

____

COURSE CONTENT

14. The explanation of the course objective was 4 3 2 1
15. The amount of material covered was 4 3 2 1
16. The audio-visual aids were 4 3 2 1
17. The relationship between lectures and labs was 4 3 2 1
18. The direction for lab assignments were 4 3 2 1
19. The relationship of the course content to my particular needs was 4 3 2 1

Comments: ____

____

(on to the next page)

Figure R-18b

TRAINING FACILITIES

20. The availability of all necessary supplies, equipment and resources were 4 3 2 1
21. The classroom facilities were 4 3 2 1
22. The lab facilities were 4 3 2 1

Comments:____

____

GENERAL

23. The challenge and motivation of the course was 4 3 2 1
24. The appearance and habits of the instructor were 4 3 2 1
25. As a result of this course, the improvement of my technical skills were 4 3 2 1
26. As a result of this course, the improvement of my knowledge was 4 3 2 1
27. I would enjoy taking another course from this instructor 4 3 2 1

Comments:____

____

LIST ANY CHANGES OR RECOMMENDATIONS FOR IMPROVEMENT: __________

____

____

____

____

Other Comments: ____________________________________

____

____

____

____

Thank you for your comments!

PROGRAM EVALUATION

We hope you have found this workshop useful. In order to help us make proper adjustments for the future, we would appreciate your candid evaluation of this program. Please leave this form on the registration desk as you depart.

1. Please print your name and address for mailing. (OPTIONAL)

Name____

Title____

Organization ____________________________________

Business Address________________________________

City ____________________ State____________ Zip________

2. Title of course attended________________________________

Location____________________ Instructor________________

3. What is your overall evaluation of the program?

_____ Excellent　　_____ Satisfactory

_____ Very Good　　_____ Unsatisfactory

4. What is the applicability or value of the subject to you?

____

____

____

5. What is your evaluation of the level of presentation given by the instructor?

_____ Excellent　　_____ Satisfactory

_____ Very Good　　_____ Unsatisfactory

6. What did you like most about this program?

____

____

____

7. What would you like added to the program?

____

____

____

(on to the next page)

Figure R-18c

8. May we use your name and comments in future notices about this program?

_____ Yes _____ No

9. Would you recommend this workshop to someone in your same position?

_____ Yes _____ Probably _____ Possibly _____ No

10. Please list the names and titles of others in your organization who should receive advance notices of similar workshops.

____

____

____

11. Any additional comments?

____

____

____

* *

12. Please help us plan future seminars by answering the following questions:

A. May we refer future participants to you for comments? _____ Yes _____ No

B. Who is your approving manager for training?

Name______________________________ Phone (   )____________

Address____________________________ FAX (   )____________

City ______________________________ State________ Zip__________

C. An on-site presentation of this seminar might be useful to your organization. Whom should we contact?

Name______________________________ Phone (   )____________

Address____________________________ FAX (   )____________

City ______________________________ State________ Zip__________

* *

13. What hotel did you stay at during your training period?

Name:______________________________

City: ______________________________

14. How many nights did you stay? _________

(on to the next page)

15. How were the sleeping/room accommodations?

1 2 3 4 5 6 7 8 9 10

Poor..Excellent

16. How was the service of the hotel personnel?

1 2 3 4 5 6 7 8 9 10

Poor..Excellent

17. How would you rate the food and refreshments provided?

1 2 3 4 5 6 7 8 9 10

Poor..Excellent

18. What did you like best about this hotel?

____

____

19. Where might this hotel improve its services?

____

____

20. What airport did you fly into?

____

21. Did you drive to our city in a rental vehicle? _____ Yes _____ No

22. Did you rent a vehicle in our city? _____ Yes _____ No

23. Did you bring your own transportation? _____ Yes _____ No

24. What museums did you visit in our city?

____

____

25. What were some of your favorite restaurants?

____

____

Thank you for your comments!

To The Employer

This institution requires that all students share in the responsibility for their own vocational development. Our objective is to help learners assume responsibility while acquiring the skills needed to enter productive wage-earning employment. Instruction is competency-based, and students are evaluated on how well they can perform specific skills.

The competencies and specific skills were prepared by a group of people from the occupational field. A "5" rating reflects the degree of competence normally associated with a skilled person with two or more years of experience. The student completing a program of instruction is expected to have the majority of ratings at the "4" and "3" levels. Skills without ratings indicate that the student chose not to study the skill or that the occupational area of specialization did not require that skill. Only skills mastered by the student will be rated by the instructor.

Employers are asked to review these skill ratings periodically so that both the employer and the employee will have an ongoing awareness of the employee's development needs.

Employers may find the Record Of Achievement useful in planning for promotions, assignments, and additional training.

____
Instructor

____
Date

Instructors are requested to authenticate the degree of mastery achieved by the student by checking the appropriate box every time the student masters a competency. Later, if a student achieves a higher degree of mastery there may be a second, and possibly a third, authentication by the instructor.

Instructors are also requested to indicate below their full name and school address.

Authentication Initials	Signature	School
Authentication Initials	Signature	School
Authentication Initials	Signature	School
Authentication Initials	Signature	School
Authentication Initials	Signature	School
Authentication Initials	Signature	School

Figure R-19

COLLEGE LOGO

Certificate of Competency

This is to certify that

has satisfactorily completed the
required competencies acknowledged on the reverse side for the program of

CONVENTIONAL MACHINING

and is hereby granted this certificate

This________day of____________________19______

______________________ Director

______________________ Instructor

CONVENTIONAL MACHINING

Overall Evaluation	
Level Achieved	Performance Levels
	5. Can perform this skill without supervision and with initiative and adaptability to problem situations.
	4. Can perform this skill satisfactorily without assistance or supervision.
	3. Can perform this skill satisfactorily but requires some assistance and/or supervision.
	2. Can perform parts of this skill satisfactorily, but requires considerable assistance and/or supervision.
	1. Cannot perform this skill

Instructor will initial level achieved

Ratings on the chart are based on industrial performance standards. They are confirmed by an instructor (a skilled and experienced person from this occupation) who views and evaluates performance as he would in the roll of an employer or supervisor.

A letter of reference attesting to the individual's attendance, punctuality, and work habits, is available from the Guidance office.

January 1996

PRACTICE SAFETY	FOLLOW SAFETY MANUALS, AND ALL SAFETY REGULATIONS/ REQUIREMENTS	USE PROTECTIVE EQUIPMENT	FOLLOW SAFE OPERATING PROCEDURES FOR HAND AND MACHINE TOOLS	MAINTAIN A CLEAN AND SAFE WORK ENVIRONMENT									
APPLY MATHEMATICAL CONCEPTS	PERFORM BASIC ARITHMETIC FUNCTIONS	INTERCONVERT FRACTIONS/ DECIMALS	INTERCONVERT METRIC/ ENGLISH MEASUREMENTS	PERFORM BASIC TRIGONOMETRIC FUNCTIONS	CALCULATE SPEEDS AND FEEDS FOR MACHINING	LOCATE MACHINING POINTS FROM A DATUM POINT	PERFORM CALCULATIONS FOR SINE BAR AND SINE PLATE	CALCULATE FOR DIRECT, SIMPLE, AND ANGULAR INDEXING	PERFORM CALCULATIONS NECESSARY FOR TURNING TAPERS	SOLVE FOR LITTLE "X"			
INTERPRET ENGINEERING DRAWINGS AND CONTROL DOCUMENTS	REVIEW BLUEPRINT NOTES AND DIMENSIONS	IDENTIFY BASIC LAYOUT OF DRAWINGS	IDENTIFY BASIC TYPES OF DRAWINGS	LIST THE PURPOSE OF EACH TYPE OF DRAWING	VERIFY DRAWING ELEMENTS	PRACTICE GEOMETRIC DIMENSIONING AND TOLERANCING (GD&T) METHODOLOGY	DESCRIBE THE RELATIONSHIP OF ENGINEERING DRAWINGS TO PLANNING	USE STANDARDS TO VERIFY REQUIREMENTS	ANALYZE BILL OF MATERIALS (BOM)	UNDERSTAND AND USE QUALITY SYSTEMS			
RECOGNIZE DIFFERENT MANUFACTURING MATERIALS AND PROCESSES	IDENTIFY MATERIALS WITH DESIRED PROPERTIES	DESCRIBE THE HEAT TREATING PROCESS	PERFORM HEAT TREATING OPERATIONS	TEST METAL SAMPLES FOR HARDNESS	IDENTIFY TYPES OF PLASTIC MATERIALS AND PROCESSES								
PERFORM MEASUREMENT/ INSPECTION	IDENTIFY TYPES OF MEASUREMENTS	SELECT PROPER MEASUREMENT TOOLS	APPLY PROPER MEASURING TECHNIQUES	USE METRIC AND ENGLISH STANDARDS OF MEASUREMENT	PERFORM MEASUREMENTS WITH HAND HELD INSTRUMENTS	PERFORM MEASUREMENTS ON SURFACE PLATE	PERFORM INSPECTIONS USING STATIONARY EQUIPMENT						
PERFORM CONVENTIONAL MACHINING OPERATIONS	PREPARE AND PLAN FOR MACHINING OPERATIONS	USE PROPER HAND TOOLS	OPERATE POWER SAWS	OPERATE DRILL PRESSES	OPERATE VERTICAL MILLING MACHINES	OPERATE HORIZONTAL MILLING MACHINES	OPERATE METAL CUTTING LATHES	OPERATE GRINDING/ ABRASIVE MACHINES	OPERATE JIG BORING MACHINES	OPERATE DEBURRING EQUIPMENT			
PERFORM ADVANCED MACHINING PROCESSES	PREPARE AND PLAN FOR CNC MACHINING OPERATIONS	SELECT AND USE CNC TOOLING SYSTEMS	PROGRAM CNC MACHINES	OPERATE CNC MACHINING CENTERS (MILLS)	OPERATE CNC TURNING CENTERS (LATHES)	OPERATE ELECTRICAL DISCHARGE MACHINES							
PERFORM GEAR CUTTING OPERATIONS	DESCRIBE THE DIFFERENT TYPES OF GEARS	UNDERSTAND GEAR TERMS	USE ROTARY TABLES AND DIVIDING HEADS	DISCUSS GEAR INSPECTION AND MEASUREMENT	MACHINE A SPUR GEAR								
PERFORM WELDING OPERATIONS	WELD WITH SHIELDED METAL ARC WELDING (SMAW) PROCESS	WELD/CUT WITH OXYACETYLENE	WELD WITH GAS TUNGSTEN ARC WELDING (GTAW) (HELIARC)	WELD WITH GAS METAL ARC WELDING (GMAW)/(MIG) & FLUX CORE ARC WELDING (FCAW)									

BEST COPY AVAILABLE

NON-TERM LENGTH CLASS REPORT

Course Title: ____________________

Course No.: __________ Sec: __________ __________

Total Hours: ______ Theory: __________ Lab: __________ CEUs: ______

Quarter/Year: __________ Weeks: __________ Class Count: ______

Beginning Date: __________ Ending Date: __________

Division: __________ Approved: __________ Unapproved: __________

Company Name: __________ Class Location: __________

Instructor: __________ Computer ID Number: __________

	NAME (Last, First, MI)	Soc.Sec. #	Id #	S/R	Grade
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					

CERTIFICATES ______ LOG ______ COMPUTER INFO. __________

CATALOG ______ COURSE/SECTION ______ ID# ______ REGISTERED ______ GRADES ______

Figure R-20

INSTRUCTOR'S TEACHING LOG

Instructor Name:____

Month: ______________________Year:__________Seminar Number:_____________________

Seminar Name: ____

Date	Preparation Hours	Teaching Hours	Comments
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			

Total Hrs.__________ Signature:______________________________

Figure R-21

PAYROLL TIME SHEET

NAME ______________________________

SEMINAR NAME ______________________________

SEMINAR NUMBER ______________________________

LOCATION OF TRAINING ______________________________

DAY	DATE	START TIME	END TIME	TOTAL HOURS	ACTIVITY
MON					
TUE					
WED					
THU					
FRI					
SAT					
SUN					
TOTAL HRS					

☐ Payment of ____________________ will be made to the individual above on ____________________ (Date).

☐ Payment will be made to individual above.

____

____
Director

Figure R-22

APPENDIX - C

Appendix C.....of the MAST Remote Site/Industrial Training Model contains examples of the Training Modules which could be developed for use in industrial training. These modules would serve as a "starting place" for developing and conducting the seminars and workshops.

AUGUSTA TECHNICAL INSTITUTE

CACT CENTER FOR APPLIED COMPETITIVE TECHNOLOGIES
San Diego City College

ITAWAMBA COMMUNITY COLLEGE 1948

Moraine Valley Community College

SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

Texas State Technical College Waco

Machine Tool Advanced Skills
Technology Program

MAST

REMOTE SITE/INDUSTRIAL TRAINING

MACHINIST

SERIES

TECHNICAL MODULE NO. MAC-E5

DUTY - PERFORM MEASUREMENT/INSPECTION

TASK - Perform Measurements With Hand Held Instruments

Average Module Completion Time - 4 Hours

Machine Tool Advanced Skills Technology (MAST) Program

MAST is a consortia of six leading technical and community colleges with training expertise in precision manufacturing technologies. These colleges are:

Augusta Technical Institute	Augusta, GA
San Diego City College (CACT)	San Diego, CA
Itawamba Community College	Tupelo, MS
Moraine Valley Community College	Palos Hills, IL
Springfield Technical College	Springfield, MA
Texas State Technical College	Waco, Texas

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This training program is one of a series of fifteen (15) which have been designed, developed, and disseminated by the **MAST** consortia partners. The fifteen technical specialty areas which were investigated by **MAST** include the following:

OCCUPATIONAL SPECIALTIES	MAST PREFIX
Manufacturing Engineering Technology	MET
Machining	MAC
Electrical Discharge Machining	EDM
Superabrasive Grinding	SAG
Mold Making	MLD
Welding	WLD
Industrial Maintenance Mechanics	IMM
Sheet Metal	SML
Composites	COM
Tool and Die	TLD
Computer Aided Design and Drafting	CAD
CNC/CAM	CNC
Instrumentation	INT
Laser Machining	LSR
Automated Equipment Repair/CIM	CIM

MAST worked jointly with industry to create these new training programs which have addressed the rapidly changing needs of the technology driven machine tool and metals related manufacturing industry. These training materials were developed after many hours of in-depth interviews with industry regarding to the "Duties" and "Tasks" which were most often performed by their workers. As a result of these interviews, a Competency Profile was developed for each participating company. These individual company Competency Profiles were then analyzed, and from them a "composite" Competency Profile was produced. After further validation, from a national survey, this "industry driven" Competency Profile was used as the basis for the development of a comprehensive series of instructional materials.
The Competency Profile for this occupational specialty is located at the end of this module. The highlighted DUTY/TASK is covered in this technical module.

This material is also available on the internet located at: **http://machinetool.tstc.edu**

MACHINIST SERIES

MASTER TECHNICAL MODULE NO. MAC-E5

Recommended Usage Key: /Remote/Secondary/College

SUBJECT: **CONVENTIONAL MACHINING** **TIME: 4 Hours**

- **DUTY:** **PERFORM MEASUREMENT/INSPECTION**
- **TASK:** **Perform Measurements with Hand Held Instruments**

OBJECTIVE(S): Upon completion of this unit the student will be able to:

a. Measure with steel rules (metric and English)
b. Measure with micrometers
c. Measure with comparison measuring instruments (e.g., calipers, telescope gages)
d. Measure with direct measuring instruments (e.g., vernier, dial and digital instruments)
e. Measure with fixed gages (go and no go gages)

INSTRUCTIONAL MATERIALS:

- Steel rules (metric and fractional) for each student or group of students
- 0-1" micrometers for each student or group of students
- Assortment of outside (larger than 1") micrometers
- 1 set inside micrometers
- 1 set depth micrometer
- 1 ea. - outside spring caliper and inside spring caliper
- 6" dial calipers for each student or group of students
- Random collection of objects for student practice.
  MAST Laboratory Aid (MAC-E5-LA)
- 1 ea. - Digital micrometer and digital vernier caliper
- 1 ea. - Set of telescoping gages and set of small hole gages
- Examples of "go-no go" gages
- Video "Precision Measurement in the Machine Shop"
  MAST Video Tape (MAC-E5-VT)
- Handout "Proper Measuring Technique"
  MAST Handout (MAC-E5-HO)

REFERENCES:

The following NTMA Machinist Training Modules are recommended as reference material.

MA-I-05 "Steel Rules"
MA-I-09 "Steel Rules and Transfer Tools"
MA-I-13 "Micrometers"
MA-I-17 "Vernier Instruments"

STUDENT PREPARATION:

Students should have previously completed the following **MAST** Technical Modules:

MAC-E1 "Identify Types of Measurements"
MAC-E2 "Select proper measurement tools"
MAC-E3 "Apply proper measuring techniques"
MAC-E4 "Use Metric and English Standards of Measurement"

INTRODUCTION:

Every aspect of our lives, from the clothes we wear to the car we drive, is greatly influenced by measurement. For the machinist, measurement is especially important since it is the machinist who is responsible for crafting the tools, fixtures and components which make up or support virtually every part of our lives. Therefore, it is essential for the machinist to be a master in the use of not only the machine tools but also the instruments which are used to measure the precision components demanded by consumers today. One of the most valuable assets you can possess is the expert use of the machinist measuring tools and a desire to practice quality consciousness in every aspect of your job performance.

PRESENTATION OUTLINE:

I. Discuss the importance of learning and practicing proper measurement techniques.
    A. Show the video "Precision Measurement in the Machine Shop"
    B. Give each student a copy of the handout "Proper Measuring Techniques"
    C. Practice and demonstration of skills listed above
II. Discuss and demonstrate proper measurement techniques using the steel rule.
III. Discuss and demonstrate the use of micrometer type measuring instruments.
    A. Outside micrometers
    B. Inside micrometers
    C. Depth micrometers
    D. Practice and demonstration of skills listed above
IV. Discuss and demonstrate the use transfer type measuring instruments.
    A. Spring calipers (inside and outside)
    B. Telescope gages
    C. Small hole gages
    D. Practice and demonstration of skills listed above
V. Discuss and demonstrate the use of direct measuring instruments.
    A. Vernier calipers
    B. Dial calipers
    C. Digital calipers
    D. Practice and demonstration of skills listed above
VI. Discuss the purpose of fixed gages and demonstrate their use.
    A. Cylindrical plug and ring gages
    B. Taper plug and ring gages
    C. Snap gages
    D. Thread plug gages
    E. Practice and demonstration of skills listed above
VII. Practical Exercise

PRACTICAL APPLICATION:

Students will practice in the lab with each measuring instrument. Each student will then complete the Laboratory Worksheet **MASTER Laboratory Worksheet (MAC-E5-LW)** and turn in to the instructor for checking.

EVALUATION AND/OR VERIFICATION:

Successful completion of this Technical Module will be based on the student's successful completion of the following three components:

1. Measure with the steel rule to an accuracy of +/- 1/32".
2. Measure with the micrometer to an accuracy of +/- 001".
3. Measure with the dial caliper to an accuracy of +/- .001"

SUMMARY:

Review the main lesson points using the handout "Proper Measuring Techniques". Hold class discussion and answer student questions.

NEXT LESSON ASSIGNMENT:

MAST Technical Module (MAC-E6) dealing with measurement and inspection using a surface plate and accessories.

TECHNICAL MODULE MATERIALS TO BE INCLUDED...

- **MAST Laboratory Aid (MAC-E5-LA)**

  This will be a drawing/explanation of a set of standards which can be produced in somebody's machine shop. These standards can be used for student practice when measuring lengths, outside diameters, inside diameters, etc.

- **MAST Video Tape (MAC-E5-VT)** "Precision Measurement in the Machine Shop"

  This will be a short description of the video tape with information regarding it's source, cost and playing time.

- **MAST Handout (MAC-E5-HO)** "Proper Measuring Techniques"

  This will be a student handout which will provide illustrations and useful information not found in the text.

- **MAST Laboratory Worksheet (MAC-E5-LW)**

  This will be a student laboratory sheet which will guide the students through a series of structured exercises in which they will learn and improve their measuring skills using the instruments which were covered in this module.

MACHINIST.... plan, layout, set up, and operate hand and machine tools to perform machining operations necessary to produce a workpiece to referenced engineering standards.

Duties		Tasks												
A	Practice Safety	A-1 Follow OSHA safety manuals and all safety regulations/requirements	A-2 Use protective equipment	A-3 Follow safe operating procedures for hand and machine tools	A-4 Maintain a clean and safe work environment									
B	Apply Mathematical Concepts	B-1 Perform basic arithmetic functions	B-2 Interconvert fractions/decimals	B-3 Interconvert Metric/English measurements	B-4 Perform basic trigonometric functions	B-5 Calculate speeds and feeds for machining	B-6 Locate machining points from a datum point	B-7 Perform calculations for sine bar and sine plate	B-8 Calculate for direct, simple, and angular indexing	B-9 Perform calculations necessary for turning tapers	B-10 Solve for little "[illegible]"	B-11 Use a scientific function calculator		
C	Interpret Engineering Drawings and Control Documents	C-1 Review blueprint notes and dimensions	C-2 Identify basic layout of drawings	C-3 Identify basic types of drawings	C-4 List the purpose of each type of drawing	C-5 Verify drawing elements	C-6 Practice geometric dimensioning and tolerancing (GD&T) methodology	C-7 Describe the relationship of engineering drawings to planning	C-8 Use standards to verify requirements	C-9 Analyze bill of materials (BOM)	C-10 Understand and use quality systems			
D	Recognize Different Manufacturing Materials and Processes	D-1 Identify types of plastic materials and processes	D-2 Identify materials with desired properties	D-3 Describe the heat treating process	D-4 Perform heat treating operations	D-5 Test metal samples for hardness	D-6 Operate sheet metal tools and devices							
E	Perform Measurement/ Inspection	E-1 Identify types of measurements	E-2 Select proper measurement tools	E-3 Apply proper measuring techniques	E-4 Use Metric and English standards of measurement	E-5 Perform measurements with hand held instruments	E-6 Perform measurements on surface plate	E-7 Perform inspections using stationary equipment						
F	Perform Conventional Machining Operations	F-1 Prepare and plan for machining operations	F-2 Use proper hand tools	F-3 Operate power saws	F-4 Operate drill presses	F-5 Operate vertical milling machines	F-6 Operate horizontal milling machines	F-7 Operate metal cutting lathes	F-8 Operate grinding/abrasive machines	F-9 Operate jig boring machines	F-10 Operate deburring equipment			
G	Perform Advanced Machining Processes	G-1 Prepare and plan for CNC machining operations	G-2 Select and use CNC tooling systems	G-3 Program CNC machines	G-4 Operate CNC machining centers (mills)	G-5 Operate CNC turning centers (lathes)	G-6 Operate automatic tracer machining							
H	Perform Gear Cutting Operations	H-1 Describe the different types of gears	H-2 Understand gear terms	H-3 Use rotary tables and dividing heads	H-4 Discuss gear inspection and measurement	H-5 Machine a spur gear								
I	Perform Welding Operations	I-1 Weld with Shielded Metal Arc Welding (SMAW) process	I-2 Weld/cut with oxyacetylene	I-3 Weld with Gas Tungsten Arc Welding (GTAW) (Heliarc)	I-4 Weld with Gas Metal Arc Welding (GMAW)(Mig) & Flux Core Arc Welding (FCAW)	I-5 Use [illegible] tool flame cutting pieces								

BEST COPY AVAILABLE

For more information:

MAST Program Director
Texas State Technical College
3801 Campus Drive
Waco, TX 76705

(817) 867-4849
FAX (817) 867-3380
1-800-792-8784
http://machinetool.tstc.edu

MACHINE TOOL ADVANCED SKILLS

TECHNOLOGY PROGRAM

MAST

REMOTE SITE/INDUSTRIAL TRAINING

INDUSTRIAL MAINTENANCE MECHANICS SERIES

AUGUSTA
TECHNICAL
INSTITUTE

TECHNICAL MODULE NO. IMM-F5

DUTY - OPERATE MACHINE TOOLS

TASK - Operate Lathe

Average Module Completion time - 68 Hours

AMTEC

Machine Tool: Advanced Skills Technology (MAST) Program

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Superabrasive Grinding	SAG
Mold Making	MLD
Welding	WLD
Industrial Maintenance Mechanics	IMM
Sheet Metal	SML
Composites	COM
Tool and Die	TLD
Computer-Aided Design And Drafting	CAD
CNC/CAM	CNC
Instrumentation	INT
Laser Machining	LSR
Automated Equipment Technician/CIM	CIM

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The Competency Profile for this occupational specialty is located at the end of the module. The highlighted DUTY/TASK is covered in the technical module.

This material is also available on the internet located at: http://machinetool.tstc.edu

INDUSTRIAL MAINTENANCE MECHANIC SERIES
MASTER TECHNICAL MODULE NO. IMM - F5
Recommended Usage Key:/Remote/Secondary/College

SUBJECT: **CONVENTIONAL MACHINING** **TIME:** **68 Hours**

- **DUTY:** **OPERATE MACHINE TOOLS**
- **TASK:** **Operate Lathe**

OBJECTIVE(S): Upon completion of this unit the student will be able to:

a. Identify major component parts of an engine lathe.
b. Properly set up and use lathe accessories required for basic lathe operation.
c. Determine correct speed and feed for a given metal.
d Identify safety concerns relative to lathe operation.
e. Demonstrate set up and use of lathe operation.
f. Identify and use different types of lathe cutting tools.
g. Face cut and turn stock between centers to a specified tolerance.
h. Demonstrate method of drilling, boring and reaming a hole to obtain specified tolerance.

INSTRUCTIONAL MATERIALS:

- Tool grinder
- Instructional material
- Hand tools
- Assortment of outside micrometers up to 3"
- Lab standards, MAST Laboratory Aid (IMM-F5-LA)
- Depth gage
- Telescoping gage
- Dial calipers
- Tool stock
- Handout reading assignments in textbook, objectives, and outlines Mast Handout (IMM-F5-HO)
- Side shield and face shield
- 2" Stock for practice and evaluation
- Engine lathe
- Technology of Machine Tools textbook, chapter 45-52, and 53
- MAST Video Tape (IMM-F5-VT1)
- MAST Laboratory worksheets (IMM-F5-LW1 and IMM-F5-LW2)

REFERENCES:

Brown, W. C., et al. (1985). Modern General Shop. South Holland, IL: Goodheart-Willcox.

Feirer, J. L. (1986). General Metals. New York: McGraw-Hill.

Kibbe, R. A., et al. (1979). Machine Tool Practices. New York: John Wiley & Sons.

Matt, S. R. (1985). Machine Tool Operations: An Introduction. Belmont, CA: Wadsworth.

The following video tapes available from Bergwall Productions in series 501(LATHE):

1. Basic Parts #501.01X-1 VHS
2. Setting Up Work #501.02X-2 VHS
3. Accessories #501.03X-1 VHS
4. Work Operations On 3 And 4 Jaw Chucks #501.04X-1 VHS
5. Three Ways To Taper #501.04X-1 VHS
6. Cutting A Thread #501.06X-1 VHS

STUDENT PREPARATION:

Students should have previously completed the following **MAST** Technical Modules:

IMM-A	"Practice Safety"
IMM-B	"Apply Mathematical Concepts"
IMM-C	"Interpret Engineering Drawings and Control Documents"
IMM-D	"Use Measuring Tools"
IMM-E1	"Use Hand Tools"
IMM-F4	"Grinders"

INTRODUCTION:

The lathe is a powered machine capable of producing many cylindrical devices used in many everyday and industrial applications. Usually the raw product is a piece of rolled solid stock. A maintenance mechanic may need to fabricate a part from a raw product or repair an existing part. The lathe is one of the most common powered tools found in a machine shop or maintenance shop in an industrial plant. If a part is cylindrical, the lathe was probably used to produced the part. Using the lathe to some degree of expertise is important to a maintenance mechanic.

PRESENTATION OUTLINE:

I. Discuss the importance of the lathe to the maintenance mechanic
  A. Give each student a copy of the following attachments:
    1. Laboratory aid and required video tapes
    2. Objectives, reading assignments, and module outline
    3. Laboratory worksheet 1 and 2
    4. Project 2 drawing and duties/tasks profile

II. Identify and discuss component parts of an engine lathe
  A. Control Panel
  B. Bed & ways
  C. Head stock
  D. Gear box
  E. Carriage
  F. Tailstock

III. Identify, setup and demonstrate use of lathe accessories
  A. Centers
  B. Chucks
  C. Faceplates
  D. Mandrels
  E. Steady and follower rest
  F. Lathe dogs
  G. Driver plates
  H. Tool holders
  I. Boring bars

IV. Discuss and demonstrate how to select the correct speed and feed for various metals
  A. Steel
  B. Aluminum
  C. Brass

V. Discuss lathe safety
  A. Clamping of work
  B. Watches & rings
  C. Housekeeping
  D. Chuck wrenches
  E. Removing chips
  F. Measurements

VI. Discuss and demonstrate use of lathe centers.
  A. Mounting
  B. Removing

   C. Aligning

VII. Discuss and demonstrate use of cutting tools.
   A. Grinding a toolbit
   B. Conditioning point of bits
   C. Types of cutting tools

VIII. Discuss and demonstrate turning between centers
   A. Why face cut
   B. Center drill
   C. Using a tailstock center
   D. Using steady rest
   E. Using chucks

IX. Discuss and demonstrate method of drilling, boring and reaming using a lathe

---

PRACTICAL APPLICATION:

Students will practice in the lab using the lathe. Each student will complete the laboratory exercise prior to proceeding to the performance evaluation.

EVALUATION AND/OR VERIFICATION:

Successful completion of this Technical Module will be based on the student's successful completion of the following components.

1. The student will complete a written evaluation of knowledge items.
2. The student will demonstrate safe operation of the lathe.
3. The student shall fabricate a component to specified tolerance when given a drawing, tools, and equipment. (Refer to figure 1).

SUMMARY:

Review the main lesson points using the objective as a guide. Hold class discussion and answer student questions.

NEXT LESSON ASSIGNMENT:

MAST Technical Module (IMM-F6) dealing with measurement and inspection using a surface plate and accessories.

TECHNICAL MODULE MATERIALS TO BE INCLUDED...

ATTACHMENT 1. Mast Laboratory Aid (IMM-F5-LA)

Standards of performance safety: Student shall:

1. Use OSHA required safety equipment for the shop:
   safety glasses - hearing protection
   face shields - gloves

2. Do not wear rings, watches, loose jewelry, or loose clothing while operating equipment.

Conduct:

1. There will be no horse play or practical joking.

2. If in doubt, as to safe operation of the equipment, **STOP** and seek guidance from the instructor.

MAST Video Tape (IMM-F5-VT1) - Feeds and Speeds

(Available by contacting MAST Program at 817/867-4849.)

ATTACHMENT 2 **MAST Handout (IMM-F5-HO)**

OBJECTIVE(S): Upon completion of this unit the student will be able to:

1. Identify major component parts of an engine lathe.
2. Properly set up and use lathe accessories required for basic lathe operation.
3. Determine correct speed and feed for a given metal.
4. Identify safety concerns relative to lathe operation.
5. Demonstrate set up and use of lathe operation.
6. Identify and use different types of lathe cutting tools.
7. Face cut and turn stock between centers to a specified tolerance.
8. Demonstrate method of drilling, boring and reaming a hole to obtain specified tolerance.

READING ASSIGNMENTS:

The following chapters are assigned to read from Technology of Machine Tools textbook, edition 4.

Chapter	Page	Title
45	297	Component parts
46	301	Accessories
47	311	Feeds and speeds
48	316	Safety
49	318	Mounting and removing centers
50	321 to 324	Grinding lathe tools
51	324	Facing between centers
52	328	Machining between centers
54	349 to 352	Turning tapers using compound rest

MODULE OUTLINE:

I. Discuss the importance of the lathe to the maintenance mechanic
   A. Give each student a copy of the following attachments:
      1. Laboratory aid and required video tapes
      2. Objectives, reading assignments, and module outline
      3. Laboratory worksheet 1
      4. Laboratory worksheet 2 and attached drawing

II. Identify and discuss component parts of an engine lathe
   A. Control Panel
   B. Bed & ways

C. Head stock
D. Gear box
E. Carriage
F. Tailstock

III. Identify, set up and demonstrate use of lathe accessories
  A. Centers
  B. Chucks
  C. Faceplates
  D. Mandrels
  E. Steady and follower rest
  F. Lathe dogs
  G. Driver plates
  H. Tool holders
  I. Boring bars

IV. Discuss and demonstrate how to select the correct speed and feed for various metals
  A. Steel
  B. Aluminum
  C. Brass

V. Discuss lathe safety
  A. Clamping of work
  B. Watches & rings
  C. Housekeeping
  D. Chuck wrenches
  E. Removing chips
  F. Measurements

VI. Discuss and demonstrate use of lathe centers
  A. Mounting
  B. Removing
  C. Aligning

VII. Discuss and demonstrate use of cutting tools
  A. Grinding toolbit
  B. Conditioning point of bits
  C. Types of cutting tools

VIII. Discuss and demonstrate turning between centers
  A. Why face cut
  B. Center drill
  C. Using a tailstock center
  D. Using steady rest
  E. Using chucks

IX. Discuss and demonstrate method of drilling, boring and reaming using a lathe

ATTACHMENT 3 **MAST Laboratory Worksheet (IMM-F5-LW1)**

WORK SHEET 1:

1. Established standards for safety and conduct shall be followed

2. Equipment required:
   Tool grinder
   Hand tools as required to operate lathe
   Set of inside and outside micrometers up to 3"
   Telescoping gages
   Dial calipers
   Toolstock
   Face shield
   Side shields
   3-6" sections of bar stock for practice
   Drill and sleeve appropriate to hole required
   Reamer appropriate for hole required
   Lathe with accessories suitable for project

3. Exercises must be taken in sequence. Instructor must confirm proficiency prior to student progressing to next exercise

4. Practice exercises tool grinding:
   A. Grind lathe cutting tool appropriate to metal being turned
      (1) Instructor must see lathe tool prior to proceeding

5. Practice exercise lathe familiarization
   A. Student shall practice using lathe controls until familiar
      (1) Selecting speeds & feeds (use of S & L chart)
      (2) Start and stopping of machine and emergency stop
      (3) Engage and disengage feed controls
      (4) Positioning tool in tool holder
   B. Student shall practice using accessories
      (1) Centering stock in available chucks
      (2) Setting up stock between centers
      (3) Running machine with stock mounted in the chuck
   C. Lathe operation
      (1) Practice taking cuts using manual feed
      (2) Practice taking cuts using the engine driven feed and speed controls
      (3) Practice center drilling
      (4) Practice drilling with the drill bit mounted in the tail stock
      (5) Practice reaming
      (6) Practice cutting a taper using the compound rest (manual feed)
   D. Fabricate a part to tolerances specified on the drawing provided

ATTACHMENT 4 **MAST Laboratory Worksheet (IMM-F5-LW2)**

WORKSHEET 2:

1. This exercise will combine the skills and knowledge practices in previous lab exercises to fabricate the component described by attachment 5

2. Preestablished safety concerns by the drawing

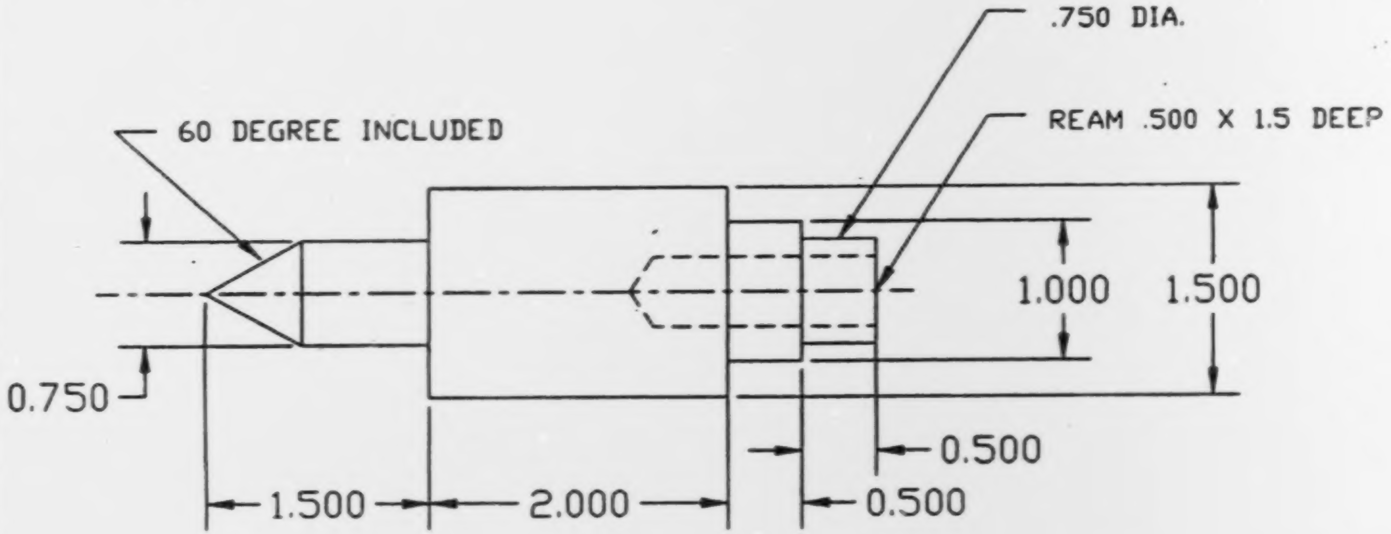
3. Maintain tolerances by the drawing

The project will require the student to demonstrate skills and knowledge in the following:

- Practice safety
- Basic math
- Blueprint reading
- Measuring instruments
- Pedestal grinder operation
- Lathe operation

ATTACHMENT 5

Attachment 5 consists of a drawing of project 2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APPROVED BY: SWG	TITLE PROJECT 2	REV. #
	MATERIAL ALUM. 6061-T3	

ATTACHMENT 6

Attachment 6 consists of the industrial maintenance mechanic duties and tasks.

INDUSTRIAL MAINTENANCE MECHANIC....uses mechanical, pneumatic, hydraulic, and electrical skills to maintain, repair and/or install equipment/machinery used in industry.

Duties		Tasks												
A	Practice Safety	A-1 Recognize OSHA requirements	A-2 Demonstrate use of personal protective equipment											
B	Apply Mathematical Concepts	B-1 Perform basic arithmetic functions	B-2 Convert fractions/ decimals	B-3 Convert Metric/English measurements	B-4 Perform basic algebraic operations	B-5 Perform basic trigonometric functions	B-6 Perform basic geometric calculations							
C	Interpret Engineering Drawings and Control Documents	C-1 Review blueprint notes and dimensions	C-2 Identify basic layout of drawings	C-3 Identify basic types of drawings										
D	Use Measuring Tools	D-1 Use non precision measuring tools	D-2 Use precision measuring tools	D-5 Use Metric and English standards of measurement										
E	Use Hand Tools	E-1 Identify and use maintenance technicians hand tools	E-2 Identify and use hand held power tools											
F	Operate Machine Tools	F-1 Use & care of pressure tools	F-2 Use & care of horiz. & vertical band saws	F-3 Use & care of pedestal grinder	F-4 Use & care of surface grinder	F-5 Use & care of lathes	F-6 Use & care of radial arm drill press							
G	Perform Welding Operations	G-1 Weld with Shielded Metal Arc Welding (SMAW) process	G-2 Weld/cut with oxyacetylene	G-3 Perform gas soldering										
H	Maintain & Troubleshoot Equipment and Systems	H-1 Maintain air conditioning systems	H-2 Maintain pneumatic control circuits	H-3 Trouble-shoot centrifugal pumps	H-4 Trouble-shoot positive displacement pumps	H-5 Maintain gate, globe, ball, plug and butterfly valves	H-6 Maintain check valves and relief valves	H-7 Trouble shoot and repair blowers	H-8 Trouble shoot, maintain, and repair hydraulic systems					
I	Repair Power Transmission Systems	I-1 Maintain & Trouble-shoot belt drive systems	I-2 Maintain & Trouble-shoot gear power transmission drives	I-3 Maintain & Trouble-shoot chain power transmission drives										
J	Fabricate/ Install Sheet Metal Parts	J-1 Layout sheet metal parts	J-2 Form and/or bend sheet metal parts	J-3 Fasten sheet metal parts together										

BEST COPY AVAILABLE

For more information:

MAST SITE COORDINATOR
RONNIE LAMBERT
Augusta Technical College
3115 Deans Bridge Road
Augusta, GA 30906

(706) 796-2360
FAX (706) 771- 4091
http://machinetool.tstc.edu.

MACHINE TOOL ADVANCED SKILLS

TECHNOLOGY PROGRAM

MAST

REMOTE SITE/INDUSTRIAL TRAINING

TOOL AND DIE MAKER SERIES

ITAWAMBA COMMUNITY COLLEGE
1948

TECHNICAL MODULE NO. TLD-D3

DUTY - **DEMONSTRATE KNOWLEDGE OF MANUFACTURING MATERIALS**

TASK - Discuss Classification System for Metals

Average Module Completion time - 8 Hours

TOOL & DIE SERIES
MAST TECHNICAL MODULE NO. TLD-D3
Recommended Usage Key: /Remote/Secondary/College

SUBJECT: **TOOL AND DIE MAKER** **TIME: 8 Hours**

- **DUTY:** **DEMONSTRATE KNOWLEDGE OF MANUFACTURING MATERIALS**
- **TASK:** **Discuss Classification System for Metals**

OBJECTIVES: Upon completion of this unit the student will be able to:

a. Identify organizations that classify metals
b. Distinguish between types of metal by manufacturing method and/or shape
c. Identify designation of each digit of a metal classification
d. Identify carbon and alloy content of a metal using classification system
e. Identify content of an unknown metal using shop tests.
f. Identify conformity of a metal to a specification system.

INSTRUCTIONAL MATERIALS:

- Random collection of objects for student practice (shop tests) and observation
  MAST Laboratory Aid (TLD-D3-LA1)
- Handout "AISI-SAE Standard Steels Classification"
  MAST Handout (TLD-D3-HO1)
- Handout "AISI Tool Steels Classification" & "UNS for Metals and Alloys"
  MAST Handout (TLD-D3-HO2)
- Handout "Example of a Specification"
  MAST Handout (TLD-D3-HO3)
- Worksheet for student practice and grade
  MAST Worksheet (TLD-D3-LW1)
- Exam
  MAST EXAM (TLD-D3-EX1)

REFERENCES:

The following NTMA Machinist Training Modules are recommended as reference material:

MA-II-57	"Metallurgy: Steel Classifications & Basic Tests for Identifying the Content of an Unknown Metal"
MA-II-59	"Metallurgy: Plain Carbon Steel"
MA-II-67	"Metallurgy: Alloy Steels and Stainless Steels"
MA-II-69	"Metallurgy: Aluminum and Aluminum Alloys"
MA-II-71	"Metallurgy: Magnesium and Magnesium Alloys"

MA-II-73 "Metallurgy: Copper and Copper Alloys"
MA-II-75 "Metallurgy: Other NonFerrous Metals and Cast Alloys"
MA-II-77 "Metallurgy: Cast Irons"

STUDENT PREPARATION:

Students should have previously completed the following MAST Technical Modules:

TLD-D1 "Discuss Physical Properties of Materials"
TLD-D2 "Identify the Properties and Characteristics of Alloying Elements"

INTRODUCTION:

When there was only wrought iron and plain carbon steel available, separating and identifying metals was relatively simple. Now, however, with the hundreds of different compositions in use, identification would be confusing without some means of reference or classification. Several different numbering systems have been developed by various organizations to classify metals and alloys according to content, properties, manufacturing process, or intended use. A Tool and Die Maker must be capable of distinguishing between materials by understanding these systems and their designations.

PRESENTATION OUTLINE:

I. Identify the organizations that classify metals and discuss the significance of each
  A. American Iron and Steel Institute (AISI)
  B. Society of Automotive Engineers (SAE)
  C. American Society for Testing and Materials (ASTM)
  D. American National Standards Institute (ANSI)
  E. Aluminum Association

II. Identify classifications by manufacturing methods or processes
  A. Hot Rolled
  B. Cold Rolled
  C. Turned & Polished (sometimes referred to as ground and polished)
  D. Castings
  E. Forgings
  F. Galvanized

III. Identify classifications by shape
  A. Sheet and Plate
  B. Bar Stock
  C. Pipe and Tubing
  D. Rod and Wire
  E. Coil or Strip

  F. Structural Steel

IV. Discuss the AISI-SAE numbering systems for carbon steels
  A. Plain Carbon Steels (AISI-SAE 10xx and 15xx)
  B. Free-Cutting Steels (AISI-SAE 11xx and 12xx)

V. Discuss the AISI-SAE classification systems for alloy steels
  A. Manganese Steels (AISI-SAE 13xx)
  B. Nickel Steels (AISI-SAE 2xxx)
  C. Nickel-Chromium Steels (AISI-SAE 3xxx)
  D. Molybdenum Steels (AISI-SAE 4xxx)
  E. Low Chromium Steels (AISI-SAE 5xxx)
  F. Other Alloy Steels (AISI-SAE 61xx, 8xxx, and 9xxx)

VI. Discuss the AISI-SAE classification of stainless steels
  A. Chromium-Nickel Austenitic Steels (SAE 30xxx or AISI 20x and 3xx)
  B. Ferritic Chromium Steels (SAE 51xxx or AISI 4xx and 50x)
  C. Martensitic Chromium Steels (SAE 51xxx or AISI 4xx and 50x)

VII. Discuss the AISI classification of tool steels
  A. High Speed Tool Steels (AISI Type M and T)
  B. Hot Work Tool Steels (AISI Type H)
  C. Cold Work Tool Steels (AISI Type D, A, and O)
  D. Shock Resisting Tool Steels (AISI Type S)
  E. Mold Steels (AISI Type P)
  F. Special Purpose Tool Steels (AISI Type L and F)
  G. Water Hardening Tool Steels (AISI Type W)

VIII. Discuss the classification of nonferrous alloys
  A. Aluminum and Aluminum Alloys (Aluminum Association Four Digit System)
  B. Magnesium Alloys (SAE Type 5x and 5xx)
  C. Nickel and Nickel Alloys (By Name)
  D. Titanium and Titanium Alloys (Titanium and Chief Alloying Element)
  E. Copper and Copper Alloys (By Name and SAE Standard No.)

IX. Discuss the classification of castings
  A. Brass and Bronze Castings (SAE Standard No.)
  B. Aluminum Casting Alloys (Aluminum Association Four Digit System)
  C. Cast Iron (ASTM Grade)
  D. Steel Castings (ASTM Grade)

X. Discuss the Unified Numbering System (UNS) for metals and alloys

XI. Discuss the basic identification of an unmarked piece of steel using shop tests
  A. Observation
  B. Magnet Test
  C. Hardness Test
  D. Scratch Test

E. File Test
F. Chemical Test
G. Spark Test

XII. Identify specification systems for metals and alloys
    A. American Society for Testing and Materials (ASTM)
    B. American National Standards Institute (ANSI)
    C. U.S. Department of Defense (Military Specifications)
    D. General Accounting Office (Federal Specifications)

PRACTICAL APPLICATION:

Students will practice identifying materials by their nomenclature and by shop tests. Each student will then complete the Laboratory Worksheet **MAST Laboratory Worksheet (TLD-D3-LW1)** and turn it into the instructor for checking.

EVALUATION AND/OR VERIFICATION:

Successful completion of this Technical Module will be based on the student's successful completion of the following components:

1. Identify organizations that classify metals.
2. Identify metal type given a classification.
3. identify content of a metal given a classification.
4. Identify content of an unknown metal using shop tests.
5. Identify conformity of a metal given an ASTM specification.

SUMMARY:

Review the main lesson points and topics during review for exam. Hold class discussion and answer student questions.

NEXT LESSON ASSIGNMENT:

MAST Technical Module (TLD-D4) dealing with the manufacturing properties of materials.

TLD-D3-HO1

AISI-SAE STANDARD STEELS CLASSIFICATION

AISI-SAE	Type of Steel and Nominal Alloy Content
	Carbon Steels
10xx	Plain Carbon (Max 1% Mn.)
15xx	Plain Carbon (Max 1% - 1.65% Mn.)
11xx	Free Cutting, Resulfurized
12xx	Free Cutting, Resulfurized and Rephosporized
	Manganese Steels
13xx	1.75% Manganese
	Nickel Steels
23xx	3.50% Nickel
25xx	5.00% Nickel
	Nickel-Chromium Steels
31xx	1.25% Nickel; 0.65% & 0.80% Chromium
32xx	1.75% Nickel; 1.07% Chromium
33xx	3.50% Nickel; 1.50% & 1.57% Chromium
34xx	3.00% Nickel; 0.77% Chromium
	Molybdenum Steels
40xx	0.20% and 0.25% Molybdenum
44xx	0.40% and 0.52% Molybdenum
	Chromium-Molybdenum Steels
41xx	0.50% - 0.95% Chromium; 0.12% - 0.30% Molybdenum
	Nickel-Molybdenum Steels
46xx	0.85% & 1.82% Nickel; 0.20% & 0.25% Molybdenum
48xx	3.50% Nickel; 0.25% Molybdenum
	Chromium Steels
50xx	0.27%- 0.65% Chromium
51xx	0.80% - 1.05% Chromium
50xxx	0.50% Chromium; Min. 1.00% Carbon
51xxx	1.02% Chromium; Min. 1.00% Carbon
52xxx	1.45% Chromium; Min. 1.00% Carbon
	Chromium-Vanadium Steels
61xx	0.60% - 0.95% Chromium; 0.10% and 0.15% Vanadium
	Tungsten-Chromium Steels
72xx	1.75% Tungsten; 0.75% Chromium
	Triple Alloy Steels
43xx	1.82% Nickel; 0.50% & 0.80% Chromium; 0.25% Molybdenum
47xx	1.05% Nickel; 0.45% Chromium; 0.20% & 0.35% Molybdenum
8xxx	0.30% - 0.55% Nickel; 0.40% - 0.50% Chromium; 0.12% - 0.35% Molybdenum
92xx	1.40% & 2.00% Silicon; 0.00% & 0.65% Chromium; 0.65% - 0.85% Manganese
93xx	3.25% Nickel; 1.20% Chromium; 0.12% Molybdenum
94xx	0.45% Nickel; 0.40% Chromium; 0.12% Molybdenum
98xx	1.00% Nickel; 0.80% Chromium; 0.25% Molybdenum

AISI	SAE	Stainless Steels
2xx	302xx	Austenitic Steels; 16% - 19% Chromium; 1% - 5.5% Nickel
3xx	303xx	Austenitic Steels; 16% - 24% Chromium; 6% - 15% Nickel
4xx	514xx	Ferritic or Martensitic Steels; 10.5% - 18% Chromium
5xx	515xx	Ferritic or Martensitic Steels; 4% - 6% Chromium

TLD-D3-HO2

AISI TOOL STEELS CLASSIFICATION

CATEGORY DESIGNATION	AISI	GROUP DESIGNATION
High Speed Tool Steels	M	Molybdenum Types
	T	Tungsten Types
Hot Work Tool Steels	H1 - H19	Chromium Types
	H20 - H39	Tungsten Types
	H40-H59	Molybdenum Types
Cold Work Tool Steels	D	High Carbon, High Chromium Types
	A	Medium Alloy, Air Hardening Types
	O	Oil Hardening Types
Shock Resisting Tool Steels	S	- - - - -
Mold Steels	P	- - - - -
Special Purpose Tool Steels	L	Low Alloy Types
	F	Carbon Tungsten Types
Water Hardening Tool Steels	W	- - - - -

UNIFIED NUMBERING SYSTEM (UNS) FOR METALS & ALLOYS

UNS SERIES	METAL
	Nonferrous Metals and Alloys
A00001 to A99999	Aluminum and Aluminum Alloys
C00001 to C99999	Copper and Copper Alloys
E00001 to E99999	Rare Earth and Rare Earth-Like Metals and Alloys
L00001 to L99999	Low Melting Metals and Alloys
M00001 to M99999	Miscellaneous Nonferrous Metals and Alloys
P00001 to P99999	Precious Metals and Alloys
R00001 to R99999	Reactive and Refractory Metals and Alloys
Z00001 to Z99999	Zinc and Zinc Alloys
	Ferrous Metals and Alloys
D00001 to D99999	Specified Mechanical Property Steels
F00001 to F99999	Cast Irons
G00001 to G99999	AISI and SAE Carbon and Alloy Steels (Except Tool Steels)
H00001 to H99999	AISI H-Steels
J00001 to J99999	Cast Steels (Except Tool Steels)
K00001 to K99999	Miscellaneous Steels and Ferrous Alloys
S00001 to S99999	Heat and Corrosion Resistant (Stainless Steels)
T00001 to T99999	Tool Steels

TLD-D3-HO3

EXAMPLE OF A SPECIFICATION

HOT ROLLED CARBON STEEL BARS

Size	Tolerance		Out-of-Section	Size	Tolerance		Out-of-Section
	Plus	Minus			Plus	Minus	
Rounds, Squares and Round-Cornered Squares							
To 5/16	.005	.005	.008	Over 1-1/2 to 2	1/64	1/64	.023
Over 5/16 to 7/16	.006	.006	.009	Over 2 to 2-1/2	1/32	0	.023
Over 7/16 to 5/8	.007	.007	.010	Over 2-1/2 to 3-1/2	3/64	0	.035
Over 5/8 to 7/8	.008	.008	.012	Over 3-1/2 to 4-1/2	1/16	0	.046
Over 7/8 to 1	.009	.009	.013	Over 4-1/2 to 5-1/2	5/64	0	.058
Over 1 to 1-1/8	.010	.010	.015	Over 5-1/2 to 6-1/2	1/8	0	.070
Over 1-1/8 to 1-1/4	.011	.011	.016	Over 6-1/2 to 8-1/4	5/32	0	.085
Over 1-1/4 to 1-3/8	.012	.012	.018	Over 8-1/4 to 9-1/2	3/16	0	.100
Over 1-3/8 to 1-1/2	.014	.014	.021	Over 9-1/2 to 10	1/4	0	.120
Hexagons							
To 1/2	.007	.007	.011	Over 1-1/2 to 2	1/32	1/64	1/32
Over 1/2 to 1	.010	.120	.015	Over 2 to 2-1/2	3/64	1/64	3/64
Over 1 to 1-1/2	.021	.130	.025	Over 2-1/2 to 3-1/2	1/16	1/64	1/16

COLD FINISHED CARBON STEEL BARS

Size	Max. % Carbon			Width or Diameter	Max. % Carbon		
	Up to .28	Over .28 to .55	Over .55		Up to .28	Over .28 to .55	Over .55
	Minus Tolerance				Minus Tolerance		
Cold Drawn Rounds				Cold Drawn Flats			
To 1-1/2	.002	.003	.005	To 3/4	.003	.004	.008
Over 1-1/2 to 2-1/2	.003	.004	.006	Over 3/4 to 1-1/2	.004	.005	.010
Over 2-1/2 to 4	.004	.005	.007	Over 1-1/2 to 3	.005	.006	.012
Over 4 to 6	.005	.006	.008	Over 3 to 4	.006	.008	0.016
				Over 4 to 6	.008	.010	.020
				Over 6	.013	.015	-----
Cold Drawn Hexagons				Cold Drawn Squares			
To 3/4	.002	.003	.006	To 3/4	.002	.004	.007
Over 3/4 to 1-1/2	.003	.004	.007	Over 3/4 to 1-1/2	.003	.005	.008
Over 1-1/2 to 2-1/2	.004	.005	.008	Over 1-1/2 to 2-1/2	.004	.006	.009
Over 2-1/2 to 3-1/8	.005	.006	.009	Over 2-1/2 to 4	.005	.008	.011
Turned and Polished Rounds							
To 1-1/2	.002	.003	.005	Over 4 to 6	.005	.006	.008
Over 1-1/2 to 2-1/2	.003	.004	.006	Over 6 to 8	.006	.007	.009
Over 2-1/2 to 4	.004	.005	.007	Over 8 to 9	.007	.008	.010

TLD-D3-LA1

LIST OF MATERIALS FOR SHOP TESTS AND ILLUSTRATION

1. Observation Test: Sample of round bars with various surface finishes (cold finished, hot rolled, ground and polished)

2. Magnet Test: Sample of carbon steel, ferritic or martensitic stainless steel, austenitic stainless steel, aluminum, and nickel steel

3. Hardness Test: Sample of mild steel, medium carbon steel, high carbon steel, alloy steel, and tool steel

4. Scratch Test: Sample of mild steel, medium carbon steel, high carbon steel, alloy steel, and tool steel

5. File Test: Sample of mild steel, medium carbon steel, high carbon steel, alloy steel, and tool steel

6. Chemical Test: Sample of carbon steel, type 302 or 304 stainless steel, type 316 or 317 stainless steel

7. Spark Test: Sample of low carbon steel, high carbon steel, cast iron, high speed steel, tool steel, and manganese steel

8. Observation Test: Samples of bar stock (round and square), hot rolled sheet, cold finished coil strip, galvanized sheet, small diameter pipe, small diameter tubing, small gauge wire, hot rolled rod, and cold finished rod

TLD-D3-LW1

I. Identify the following:

A. AISI ______________________________

B. SAE ______________________________

C. ASTM ______________________________

D. ANSI ______________________________

E. UNS ______________________________

II. Complete the following charts:

A. Standard Steels and Alloy Steels

	AISI-SAE	**APP. % CARBON**	**MAJOR ALLOYING ELEMENTS**
Ex.	1020	.20	Only Carbon
Ex.	6118	.18	Chromium & Vanadium
Ex.	4340	.40	Nickel, Chromium, Molybdenum
1.	1040		
2.	1095		
3.	1212		
4.	1340		
5.	2340		
6.	2512		
7.	3140		
8.	3310		
9.	4024		
10.	4140		
11.	4320		
12.	4620		
13.	5135		
14.	52100		
15.	6150		

B. AISI-SAE-UNS Classification System

	AISI-SAE	UNS	TYPE METAL OR STEEL
Ex.	1212	G12120	Free Cutting Carbon Steel
Ex.	48xx	G48xx0	Nickel- Molybdenum Steel
Ex.	A6	T30106	Air Harden Cold Work Tool Steel
1.	1527		
2.	1151		
3.		G10290	
4.		G41xx0	
5.		G61500	
6.			Tungsten-Chromium Steels
7.			Austenitic Stainless Steels
8.			Nickel Steels
9.	H21	T20821	
10.		T12002	Tungsten High Speed Tool Steels
11.	Sx	T4190x	
12.	D2	T30402	
13.		T41906	Shock Resisting Tool Steels
14.	-----	Axxxxx	
15.			Copper and Copper Alloy

III. Answer the following questions:

A. What is the out-of-round tolerance for 2-1/2" diameter hot rolled bar?

B. What is the size tolerance for 1-3/4" cold finished hexagon bar made from 1045?

C. If the only requirements given you were 1" 1018 square bar with a size tolerance of -.006, would you choose hot rolled (much cheaper) or cold finished stock?

IV. Record the results of your shop test below.

Item No. Test Used Kind of Metal

1. ______________________________

2. ______________________________

3. ______________________________

4. ______________________________

5. ______________________________

TLD-D3-EX1
EXAM

1. Who is the AISI?

2. Who is the SAE?

3. What organization's classification system of aluminum and aluminum alloys is accepted by industry and used by commercial producers?

4. What organization has published a specification system for metals and alloys?

5. Name three classes of metals by manufacturing method, process, or material finish.

6. Identify four basic shapes that metals are produced in.

7. What do the first two digits of a steel name designate?

8. What do the last two digits (in a four-digit name) designate?

9. What is the approximate percent of carbon in 1045 carbon steel?

10. What is the approximate percent of carbon in 52100 chromium steel?

11. What type steel is 4147?

12. What is the alloying element in 2517 steel? What percent of that element is present?

13. If the element chromium makes steel stainless, why are the 5xxx and 5xxxx steels not included in the stainless steel group?

14. Name three types of stainless steel.

15. Which types are magnetic?

16. What element is added to austenitic stainless steels to improve ductility and other properties?

17. What type steel is indicated by the symbol W1 or A6?

18. What type tool steel is designated by the symbol D (category and group designations)?

19. What three groups of cold work tool steels are available?

20. What is the designation for water hardening tool steel?

21. Identify three categories of nonferrous alloys.

22. What category of nonferrous metals does brass and bronze belong to?

23. What does the first digit of an aluminum designation identify?

24. What are the basic temper designations and subdivisions for aluminum alloys?

25. Name 5 basic types of cast iron.

26. Name 2 basic types of steel castings.

27. What is the UNS designation for 1212 free cutting carbon steel?

28. What type metal are the T series numbers reserved for in the UNS numbering system?

29. What does a G as the first digit of a UNS classification designate?

30. What is the AISI-SAE classification for a G13300 steel?

31. When checking the hardness of a piece of steel with the file test, the file slides over the surface without cutting. What type steel is it most likely to be?

32. What can you determine about a metal by observation?

33. If an unknown sample can not be scratched by a piece of mild steel keystock but the keystock can be scratched by the sample, what conclusion can you draw about the sample?

34. If a hardness tester is not available, how can you determine relative hardness of a sample?

35. When spark testing a sample to determine carbon content, what does orange carrier lines ending in pear-shaped globules and very little branching indicate?

36. What is the out-of-round tolerance for 2-1/2" diameter hot rolled bar?

37. What is the maximum width of 1-1/4" key made from 1045 cold finished square bar? What is the minimum width?

38. What is the maximum diameter of a shaft made from 5" hot rolled 1018 bar? What is the minimum?

39. Name two other specification systems in use.

40. Define color coding and explain what it is used for.

TOOL AND DIE MAKER .... skilled workers who produce tools, dies, and special guiding and holding devices that are used in machines and produce a variety of products

	Duties	Tasks												
A	Practice Safety	A-1 Follow safety manuals and all safety regulations/ requirements	A-2 Maintain safe equipment and machinery	A-3 Maintain a clean and safe work environment	A-4 Use safe operating procedures for hand and machine tools	A-5 Use safe machining practices	A-6 Use safe lifting practices	A-7 Consult and apply MSDS for hazards of various materials						
B	Apply Mathematical Concepts	B-1 Perform basic arithmetic functions	B-2 Perform basic algebraic operations	B-3 Perform basic trigonometric functions	B-4 Use basic geometric principles	B-5 Use and apply cartesian coordinate system								
C	Demonstrate Quality Control and Management	C-1 Utilize appropriate inspection techniques	C-2 Perform appropriate use and calibration of inspection equipment	C-3 Know qualitative parameters of machinery and equipment	C-4 Maintain equipment to produce quality parts	C-5 Know and use quality systems	C-6 Write inspection procedures	C-7 Document inspection results						
D	Demonstrate Knowledge of Manufacturing Materials	D-1 Identify materials with desired properties	D-2 Demonstrate knowledge of physical properties of materials	D-3 Discuss classification system for metals										
E	Demonstrate Knowledge of Manufacturing Processes	E-1 Know operation of vertical and horizontal mills and tooling	E-2 Know operation of engine and turret lathes and tooling	E-3 Know operation of drill presses and tooling	E-4 Know operation of surface and cylindrical grinders	E-5 Know operation of heat treating equipment	E-6 Know operation of welding equipment	E-7 Know sheet metal operations	E-8 Know operation of jig-boring machines and tooling	E-9 Know operation of tool and cutter grinders	E-10 Know operation of metal saws	E-11 Know operation of wire EDM	E-12 Estimate time required/ cost to produce a part	E-13 Know proper flow of parts through shop
		E-14 Utilize concepts and principles of fixturing	E-15 Make calculations for and use sine bar / sine plate	E-16 Make calculations for rotary table and dividing head										
F	Perform CNC Programming/ CAM Tasks	F-1 Prepare and plan for CNC machining operations	F-2 Select, use, and acquire tooling systems for CNC machines	F-3 Manually program CNC machines	F-4 Use Computer-Aided-Manufacturing (CAM) system									
G	Demonstrate Communication Skills	G-1 Use written correspondence	G-2 Use written technical information	G-3 Communicate technical information verbally	G-4 Use graphics for visual aid									
H	Perform Drafting/CAD Tasks	H-1 Demonstrate traditional mechanical drafting skills	H-2 Use Computer-Aided Drafting (CAD) system	H-3 Use and apply GD&T methodology										
I	Use Computers	I-1 Use computer operating systems	I-2 Use file management systems	I-3 Perform backup on a personal computer	I-4 Install/use software packages	I-7 Understand and apply computer terminology								

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Duties		Tasks												
J	Interpret/Use Blueprints and Related Documents	J-1 Interpret, review, and apply blueprint notes, dimensions, and tolerances	J-2 Interpret and understand basic layout/ types of drawings	J-3 Understand and analyze bill of materials	J-4 Ascertain job requirements from drawings									
K	Perform Die Operations	K-1 Utilize basic die theory	K-2 Perform die repair	K-3 Demonstrate die making skills	K-4 Demonstrate understanding of different types of industrial dies									

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For more information:

MAST SITE COORDINATOR
BARRY EMISON
Itawamba Community College
653 Eason Boulevard
Tupelo, MS 38801

(601) 680-8489
FAX (601) 680-9545
http://machinetool.tstc.edu.

For more information:

MAST Program Director
Texas State Technical College
3801 Campus Drive
Waco, TX 76705

(817) 867-4849
FAX (817) 867-3380
1-800-792-8784
http://machinetool.tstc.edu